

Proceedings of
the United States
National Museum



SMITHSONIAN INSTITUTION • WASHINGTON, D.C.

Volume 114

1963

Number 3469

SOME NORTH AMERICAN MOTHS OF THE GENUS *ACLERIS*
(LEPIDOPTERA: TORTRICIDAE)

BY NICHOLAS S. OBRATZSOV¹

The revision of 43 Canadian species of the genus *Acleris* Hübner (*Peronea* Curtis) by McDunnough (1934) remains the most complete paper dealing with the Nearctic moths of this genus. In his later papers the same author gave additional notes on some *Acleris* species and described two as new. Pending a new revision of the entire genus, the present author decided to publish his few notes on the North American *Acleris* species which were made during his main work on a generic revision of the Nearctic Tortricidae. The paper contains systematic, distributional, and biological data on some known species and descriptions of seven new species and one new subspecies. The study is based on the materials in the collections of the United States National Museum (USNM), the American Museum of Natural History (AMNH), the British Museum (Natural History) (BM), and some others.

The work for the present paper was done under the auspices of the National Science Foundation. The author acknowledges with thanks the kind assistance of Dr. J. F. Gates Clarke (Washington), Prof. A. B.

¹ Research fellow, Department of Entomology, the American Museum of Natural History.

Klots and Dr. F. H. Rindge (New York), and Mr. J. D. Bradley (London), who enabled him to use the materials of the above museums. A special acknowledgement goes to Dr. W. E. Forster (Zoologische Sammlung des Bayerischen Staates, Munich, Germany) who placed at the author's disposal a collection of genitalia slides of the European *Acleris* species, made by the author during his work in Germany.

Acleris macdunnoughi, new species

FIGURE 1; PLATE 1 (FIG. 1)

- Teras schalleriana*.—Fernald (not Linné), 1882, Trans. Amer. Ent. Soc., vol. 10, p. 8.—Grote, 1882, New check list of North American moths, p. 57, no. 17.
- Alcecis* [sic] *schalleriana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5315, 1902.
- Peronea schalleriana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62 (in part); 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62 (in part).—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7420.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 485, 1923.
- Peronea latifasciana*.—McDunnough (not Haworth), 1934, Canadian Journ. Res., vol. 11, pp. 296, 325 (fig. 5), 329 (fig. 7); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7478.
- Peronea latifasciana* form *labeculana*.—McDunnough (not Freyer), 1934, Canadian Journ. Res., vol. 11, p. 296.

Antennae dark brown, slightly shot with ochreous, with fine whitish annulation; at underside somewhat darker without such annulation. Head and body ruddy brown. Forewings whitish brown-gray with fine dark-brown transverse, sometimes obliterate striation. Basal quarter of forewing and a large triangular or trapezoidal costal spot ruddy brown or black-brown. Often this spot is continued dorsad as a transverse fascia reaching the vein A_{2+3} , or the entire external part of forewing is ruddy brown. Some specimens have no other markings of forewings but the costal spot. Cilia brownish gray, sometimes mixed with whitish scales. Length of forewing, 8–9 mm. Hind wings smoky brownish with cilia somewhat paler.

MALE GENITALIA.—Tegumen rather broad; gnathos with a distinct ventroapical keel; socii very large, erect, extending beyond apex of tegumen. Valvae elongate with distinct subtriangular cucullus; brachiola rather narrow; sacculus narrowly emarginate beyond half, with outer edge of emargination produced downward and forming an acute spine on lower angle of cucullus; external tuft well developed. Aedoeagus short, stout, slightly bent; vesica with 6 to 10 rather thick spinelike, almost equally sized cornuti arranged in two groups.

FEMALE GENITALIA.—Sterigma with moderately long parallel lateral lobes suddenly dilated at base. Ostium bursae indicated by a long narrow split. Antrum large, slightly sclerotized, with a short wide blind prominence cephalad. No separate ductus bursae; ductus

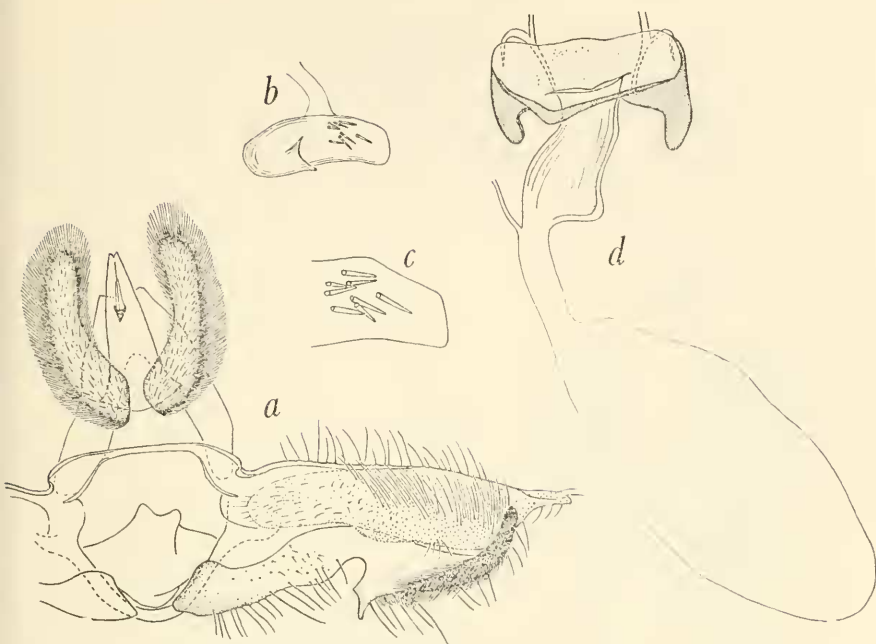


FIGURE 1.—*Acleris macdunnoughi*, new species: *a*, male genitalia with aedeagus removed (slide 411-Obr.); *b*, aedeagus; *c*, cornuti (more enlarged); *d*, female genitalia (slide 412-Obr.).

seminalis joining close to antrum. Cervix bursae short; corpus bursae elongate without signum.

TYPES.—Holotype, female (genitalia on slide, prepared by A. Busck, Mar. 12, 1935), Winchendon, Mass., Sept. 29, 1902; allotype, male, same locality, Sept. 23, 1902; both in USNM (No. 65585). Paratypes: four males (genitalia on slides, prepared by A. Busck, Feb. 2, 1922; Nov. 2, 1924; Mar. 12 and 13, 1935), same locality, Sept. 23, 26, and 29, 1902, USNM; eight males and three females (genitalia on slides 411-Obr., 412-Obr., 460-Obr., and 461-Obr.), same locality, Sept. 6–Oct. 12, 1902, AMNH. All types originate from Kearfott Collection.

OTHER SPECIMENS EXAMINED.—One male (genitalia on slide 430-Obr.), Winnipeg, Manitoba (A. W. Hanham), AMNH; one slide with male genitalia (prepared by A. Busck, Mar. 11, 1924), Meach Lake, Quebec (C. H. Young), moth not located, USNM; one male, Catskill Mountains, N.Y. Aug. 29, 1905, AMNH.

REMARKS.—This is the Nearctic species confused in the collections and literature for the Palearctic *Acleris latifasciana* (Haworth) (*schalleriana* auctorum, not Linné), which it really resembles. McDun-

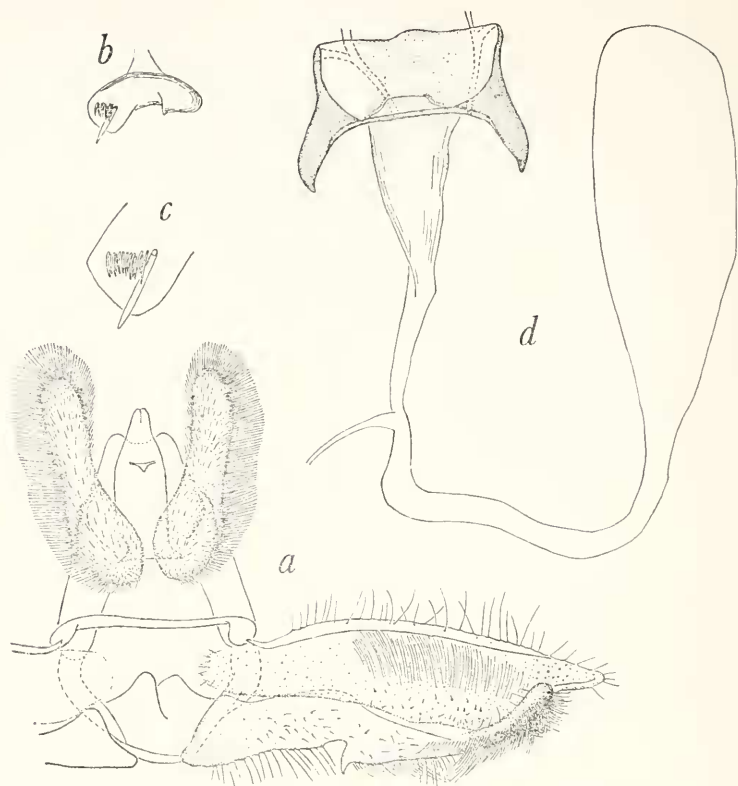


FIGURE 2.—*Acleris latifasciana* (Haworth): *a*, male genitalia with aedeagus removed (slide 410-Obr., England, AMNH); *b*, aedeagus; *c*, cornuti (more enlarged); *d*, female genitalia (slide 413-Obr., Brighton, Essex, England, AMNH).

nough (1934) first described and figured the genitalia of this species, and the present author takes pleasure in naming it for the late investigator of the Canadian *Acleris* species. In *latifasciana* (fig. 2), the ventroapical spine of the gnathos is more flat than in *macdunnoughi*, the emargination of the sacculus of the valva is not so deep and is situated slightly more basad, and the vesica has one long thick cornutus and many shorter ones. The lateral lobes of the sterigma in the female genitalia of *latifasciana* are not dilated basad as in *macdunnoughi*, and the antrum is membranous without any lateral prominence.

Acleris comariana (Zeller)

Teras comariana Zeller, 1846, Isis, p. 263.—Herrich-Schäffer, 1850, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, Tortricides, pl. 54, fig. 387; 1851, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, p. 153.—Lederer, 1859, Wiener Ent. Monatschr., vol. 3, p. 152.—Wocke, 1861, in Staudinger and Wocke, Catalog der Lepidopteren Europa's, p. 94,

no. 561.—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 27, p. 208.—Snellen, 1882, Vlinders van Nederland, Microlepidoptera, p. 188.—Sorhagen, 1882, Berliner Ent. Zeitschr., vol. 26, p. 129; 1901, Allgem. Zeitschr. Ent., vol. 6, p. 312.

Teras comparana aberration *comariana*.—Wocke, 1871, in Staudinger and Wocke, Catalog der Lepidopteren des europaischen Faunengebiets, p. 234, no. 673b.

Peronea comariana.—Nolcken, 1871, Ent. Monthly Mag., vol. 7, p. 233.—Barrett, 1905, Lepidoptera of the British Islands, vol. 10, p. 243, pl. 455, figs. 4, 4a.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Sheldon, 1925, The Ent., vol. 58, p. 281.—Meyrick, 1927, Revised handbook of British Lepidoptera, p. 523.—Kemner, 1927, Meddel. Centralanst. Försöksväsendet Jordbrukssomradet, no. 315, ent. avd., no. 50, pp. 1-37, figs. 1-9.—Sheldon, 1931, The Ent., vol. 64, p. 33.—Lhomme, 1939, Catalogue des lépidoptères de France et de Belgique, vol. 2, p. 292.—Benander, 1946, Opuscula Ent. (Lund), vol. 11, p. 16; 1950, Svensk Insektfauna, pt. 10, p. 19, text figs. 1a and 3r.

Acalla comariana.—Meyrick, 1895, Handbook of British Lepidoptera, p. 524.—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palae-arectischen Faunengebietes, vol. 2, p. 83, no. 1470.—Kennel, 1908, Die palae-arktischen Tortriciden, p. 92.—Benander, 1928, Ent. Tidskr., vol. 49, p. 135, 1934, Ent. Tidskr., vol. 55, p. 122, pl. 1, fig. 1.—Schütze, 1931, Biologie der Kleinschmetterlinge, p. 111.—Dufrane, 1945, Lambillionea, vol. 45, p. 33.—Heddergott, 1953, in Blunck, Handbuch der Pflanzenkrankheiten, vol. 4, pt. 1, fasc. 2, p. 107.

Oxygrapha comariana.—Petherbridge, 1920, Ann. Appl. Biol., vol. 7, p. 6, pl. 1.

Argotoxa [sic] *comparana* (by mistake).—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, pl. 7.

Argotoxa [sic] *comariana*.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 17; 1935, Genitalia of the tineid families, p. 114.

Acalla meincki Amsel, 1930, Mitt. Deutschen Ent. Ges., vol. 1, p. 50; 1930, Iris, vol. 44, p. 100; 1932, Deutsche Ent. Zeitschr., p. 24, pl. 1, fig. 4.

Peronea latifasciana var. *comparana* (by mistake).—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 297; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7478a.

Acleris comariana.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 129 (synonymy and list of individual forms).

McDunnough (1934) mentioned as var. *comparana* a species of the group *latifasciana*, recorded in Canada. He wrote that this species has been "frequently intercepted in the larval or pupal state on azaleas imported from Holland and Belgium," and it "appears to show constant, slight genitalic differences which may indicate specific or at least racial distinctness," in comparison to another Canadian species which McDunnough called *latifasciana* and which in fact is a new species described in the present paper as *macdunnoughi*. As noted by McDunnough, the genitalia of the species found in Canada on imported azaleas "agree remarkably well with Pierce's figures of *comparana* Hübner; in the male the anal sheath lacks spiculation, the sacculus emargination is rectangular and the aedeagus is distinctly smaller and without any cornuti." The present author had the opportunity to examine two males and one female of the species men-

tioned by McDunnough, and he has no doubts that these specimens are *Acleris comariana*, a species as yet known from the Palearctic region only. It is no wonder that McDunnough found the genitalia of this "azalea pest" similar to those figured by Pierce and Metcalfe (1922) as *comparana*, because these figures represent in fact not *comparana* but *comariana*, as Pierce noted in another, more recent paper (Pierce and Metcalfe, 1935).

Some details on the structure of the genitalia of *comariana* are not quite clear from the literature, or they have been omitted or explained incorrectly. The gnathos ("anal sheath") of *comariana* has a weak spiculation which easily can be overlooked in a superficial observation, because the middle keel of the gnathos in this species is flatter and less pointed than in the related *latifasciana*. This keel is present in both males of *comariana* from Canada as in the male from England, examined by the present author. Presence of some fine short cornuti has been established in this English specimen and in some other specimens of *comariana* seen before. These cornuti are of equal length. A single cornutus has been found in a Canadian specimen also. The sacculus of the valva of *comariana* has an almost rectangular emargination which is broader than that of *latifasciana*. The lower angle of the sacculus of *comariana* is rather less pointed. In the female genitalia of this species, the lateral lobes of the sterigma are very typical, being slightly bent inward. The antrum is somewhat shorter than in *latifasciana*, separated quite indistinctly from the ductus bursae, and not sclerotized at all.

It is important to mention that in the European literature *comariana* is known as feeding on *Comarum palustre* and strawberries, but the closely related *latifasciana* Haworth (*schalleriana* auctorum, non Linné) became known as "Azaleenwickler," that is, "azalea leaf roller." This latter species reportedly damages azaleas and roses in greenhouses, and in nature is also injurious to *Rhododendron*, *Vaccinium*, *Salix*, and some other plants, being rather a general feeder (Heddergott, 1953, p. 107). This mention of azaleas and *Rhododendron* as food plants of *latifasciana* is rather suspicious, especially in connection with the fact that Kaven (1934, p. 124), reporting this species as damaging *Rhododendron*, named it "der an Erdbeeren vorkommende Wickler," (strawberry leaf roller). Inasmuch as *comariana* (but not *latifasciana*) is commonly known as a pest of strawberries, we can suppose an error in the identification of the species attacking azaleas and *Rhododendron* in Europe. This error seems to be the more possible because the genitalia of *comariana* and one of the individual forms of *latifasciana* (aberration *comparana*) were reversely confused by Pierce and Metcalfe (1922) whose book is the basic work generally used for identification of European tor-

trichids. The larvae of *latifasciana* and *comariana* are rather similar, and Swatschek (1958, p. 74) is even inclined to treat them as variations of one and the same species. He found, nevertheless, that, in distinction from *latifasciana*, the larva of *comariana* (which he erroneously calls *comparana*) has the cervical shield dark-edged anally and that its thoracic legs and warts are brown. Meyrick (1895, p. 525) and Sorhagen (1901, p. 311) gave dark-green lateral lines as a character of the larva of *comariana*. None of the authors distinguishing between *latifasciana* and *comariana* mention any lateral lines in the larva of the former species. Only Pape (1939, p. 169), describing the larvae of the "Azaleenwickler" under the name *schalleriana*, gives these lines as their character. The problem, whether *comariana* or *latifasciana* is the real "azalea pest" in Europe, cannot be definitively resolved in the present paper, and the answer on this question is expected from the European entomologists. It is, nevertheless, completely clear that the species found in Canada on imported azaleas is *comariana* but not *latifasciana*.

The present note is based on the first authentic record of *comariana* in North America. This species has been known before only from Europe; its record in Kwangtung (Meyrick, 1934; p. 31) is somewhat doubtful.

SPECIMENS EXAMINED.—One male and one female (genitalia on slide, prepared by A. Busck, Oct. 29, 1924), "on azalea from Belgium, imported to Ottawa, Canada, Oct. 24, 1924"; one male (genitalia on slide, prepared by A. Busck, Jan. 11, 1924), Montreal, Quebec; one male and one female (genitalia on slides 3—Obr. and 4—Obr., Oct. 29, 1959), Madeley, England, Sept. 16 and Oct. 8, 1928 (H. C. Hayward). All specimens in USNM.

Acleris ptychogrammos (Zeller), new combination

Teras hastiana var. *ptychogrammos* Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 213.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7.

Acleris [sic] *hastiana ptychogrammos*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5309g, 1902.

Peronea hastiana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 68; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64.

Peronea hastiana form *ptychogrammos*.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7439.

Peronea hastiana var. *ptychogrammos*.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 486, 1923.

Peronea ptychogrammos.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 293, 325 (fig. 6), 329 (fig. 3); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7474.

FOOD PLANT.—*Cornus stolonifera* (in accordance with label data of a male from Putnam County, Ill., June 29, 1956, M. O. Glenn, in USNM.)

Acleris nivisellana (Walsingham)

Teras nivisellana Walsingham, 1897, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 2, pl. 61, fig. 3—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 8.—Grote, 1882, New check list of North American moths, p. 57, no. 16.

Alceris [sic] *nivisellana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5314, 1902.

Peronea nivisellana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 63; 1913, in Wytsman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7425.—Barnes and Pusek, 1920, Contr. Nat. Hist. Lep. North America, vol. 4, pl. 32, fig. 9.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484, 1923.—Filipjev, [1931], Ann. Mus. Zool. Acad. Sci. URSS, vol. 31, pp. 520, 527, and 528; pls. 26 (figs. 1 and 1a), 32 (fig. 3), 1930.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 315, 327 (fig. 6), 332 (fig. 1); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7504; 1940, Canadian Ent., vol. 72, p. 61.

Acleris nivisellana.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 131.

Walsingham established this species on the basis of two specimens which are deposited now in the collection of the British Museum (Natural History). The present author examined both specimens during his visit to London in 1958, and convinced himself of their identity with the species known in the literature as *nivisellana*. These two specimens, one of which becomes now a lectotype, the other a lectoallotype, are not both females as indicated on labels—the lectoallotype is a male. For the collecting locality of this latter specimen, Walsingham named in his paper "near Rouge River," but the original label of the collector reads "Umpqua River." The latter locality seems to be correct, and corresponds to the map in Walsingham's itinerary published by Essig (1941). At the Rogue River (misspelled as "Rouge River" in Walsingham's paper) Walsingham did not collect at all.

TYPES.—Lectotype, female, Mount Shasta, Siskiyou County, Calif., Aug. 2 till Sept. 1, 1871 (Walsingham); lecto-allotype, male, Umpqua River, Douglas County, Oreg., Apr. 28 till May 3, 1872 (Walsingham). Both types in BM.

Acleris tripunctana (Hübner)

?*Pyralis centrana* Fabricius, 1794, Entomologia systematica, vol. 3, pt. 2, p. 273.
Tripunctana Hübner, 1796-1799, Sammlung europäischer Schmetterlinge, Tortrices, pl. 20, fig. 129.

?*Pyralis approximana* Fabricius, 1798, Supplementum entomologiae systematicae, p. 478.

Tortrix rufana.—Haworth (not Schiffermiller and Denis), 1811, Lepidoptera Britannica, p. 417.

- Tortrix tripunctulana* (in part).—Haworth, 1811, *Lepidoptera Britannica*, p. 417.
- Tortrix ferrugana*.—Zincken (not Schiffermiller and Denis), 1821, in Charpentier, *Die Zinsler, Wickler, Schaben und Geistchen des Systematischen Verzeichnisses der Schmetterlinge der Wiener Gegend*, p. 54.—Werneburg, 1864, *Beiträge zur Schmetterlingskunde*, vol. 1, p. 461.
- Eutrachia tripunctana*.—Hübner, 1822, *Systematisch-alphabetisches Verzeichniss*, p. 65.
- Acleris triana* Hübner, 1825, *Verzeichniss bekannter Schmettlinge* [sic], p. 384.
- ?*Tortrix gilvana* Frölich, 1828, *Enumeratio Tortricum Württembergiae*, p. 24.
- ?*Tortrix ochreana*.—Frölich (not Hübner), 1828, *Enumeratio Tortricum Württembergiae*, p. 25.
- Teras ferrugana*.—Treitschke (not Schiffermiller and Denis), 1830, *Schmetterlinge von Europa*, vol. 8, p. 263 (in part); 1835, *Schmetterlinge von Europa*, vol. 10, pt. 3, pp. 136 and 261 (in part).—Fischer von Röslerstamm, 1836, *Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde*, p. 40, pls. 23 (figs. a–k), 24 (figs. e and e–h), 25 (figs. 1b and 1e).—Zeller, 1847, *Isis*, p. 739.—Herrieh-Schäffer, 1849, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, *Tortricides*, pl. 57, fig. 407; 1851, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, p. 146.—Zeller, 1853, *Stettiner Ent. Zeit.*, vol. 14, p. 54; ?1875, *Verhandl. zool.-bot. Ges. Wien*, vol. 25, p. 212.—Lederer, 1859, *Wiener Ent. Monatschr.*, vol. 3, p. 155.—Wocke, 1861, in Staudinger and Wocke, *Catalog der Lepidopteren Europa's*, p. 95, no. 579.—Walker, 1863, *List of the . . . lepidopterous insects in the British Museum*, pt. 27, p. 211.—Heinemann, 1863, *Schmetterlinge Deutschlands und der Schweiz*, Abth. 2, vol. 1, pt. 1, p. 25 (in part).—Sorhagen, 1882, *Berliner Ent. Zeitschr.*, vol. 26, p. 130.—?Fernald, 1882, *Trans. Amer. Ent. Soc.*, vol. 10, p. 8 (in part).—?Grote, 1882, *New check list of North American moths*, p. 57, no. 18.—Bentinck, 1936, *Tijdschr. Ent.*, vol. 79, pp. 200 and 205.
- Paramesia tripunctana*.—Curtis, 1833, *British entomology*, expl. pl. 440.
- Peronea (Acleris) costimaculana* Stephens, 1834, *Illustrations of British entomology, Haustellata*, vol. 4, p. 160.
- Peronea costimaculana*.—Curtis, post 1834, *British entomology*. . . , expl. pl. 16, p. 8.—Wood, 1839, *Index entomologicus*, p. 159, pl. 36, fig. 1087.—(Stephens, 1829, *Systematic catalogue of British insects*, pt. 2, p. 187, no. 7084; nomen nudum.)
- Teras ferrugana* var. (and/or aberration) *tripunctana*.—Treitschke, 1835, *Schmetterlinge von Europa*, vol. 10, pt. 3, pp. 136 and 262.—Herrieh-Schäffer, 1851, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, p. 146.—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 212.—Wocke, 1871, in Staudinger and Wocke, *Catalog der Lepidopteren des europäischen Faunengebiets*, p. 235, no. 676a.—Snellen, 1882, *Vlinders van Nederland, Microlepidoptera*, p. 185.—Wallengren, 1888, *Ent. Tidskr.*, vol. 9, p. 167.
- Glyphiptera tripunctana*.—Duponchel, 1835, *Histoire naturelle des lépidoptères ou papillons de France*, vol. 9, p. 141, pl. 243, fig. 2.
- ?*Teras longulana* Eversmann, 1844, *Fauna lepidopterologica Volgo-Uralensis*, p. 525.
- Teras proteana* Guenée, 1845, *Ann. Soc. Ent. France*, ser. 2, vol. 3, p. 146; [1846], *Europaeorum Microlepidopterorum index methodicus*, p. 12, 1845.—Heinemann, 1863, *Schmetterlinge Deutschlands und der Schweiz*, Abth. 2, vol. 1, pt. 1, p. 25.—de Joannis, 1919, *Ann. Soc. Ent. France*, vol. 88, p. 5.

- Glyphiptera ferrugana* var. *tripunctana* Duponchel, 1845, Catalogue méthodique des lépidoptères d'Europe, p. 293.
- ?*Glyphiptera longulana*.—Duponchel, 1845, Catalogue méthodique des lépidoptères d'Europe, p. 293.
- Acleris costimaculana*.—Westwood and Humphreys, 1845, British moths and their transformations, vol. 2, p. 163, pl. 96, fig. 1.
- Peronea (Acleris) comparana*.—Stephens (not Hübner), 1852, List of the specimens of British animals in the British Museum, pt. 10, p. 18 (in part).
- Paramesia ferrugana*.—Stephens, 1852, List of the specimens of British animals in the British Museum, pt. 10, p. 20. Wilkinson, 1859, British tortricides, p. 178.—Stainton, 1859, Manual of British butterflies and moths, vol. 2, p. 235.
- Teras comparana* (in part).—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 27, p. 211.
- Tortrix approximana*.—Werneburg, 1864, Beiträge zur Schmetterlingskunde, vol. 1, p. 461.
- Acalla ferrugana*.—Meyrick, 1895, Handbook of British Lepidoptera, p. 525.—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palaerctischen Faunengebietes, vol. 2, p. 83, no. 1473 (in part).—Kennel, 1907, in Spuler, Schmetterlinge Europas, vol. 2, p. 244, pl. 83, fig. 22; 1908, Die palaearctischen Tortriciden, p. 93, pl. 5, fig. 44.—Benander, 1929, Ent. Tidskr., vol. 50, p. 133, figures 9a-f: 1934, Ent. Tidskr., vol. 55, p. 124, pl. 2, fig. 2.—Escherich, 1931, Forstinsekten Mitteleuropas, vol. 3, text fig. 183c (right side), pl. 2, fig. 1b.—Hering, 1932, in Brohmer, Ehrmann, and Ulmer, Tierwelt Mitteleuropas, suppl. 1, p. 242, fig. 437.—Eckstein, 1933, Schmetterlinge Deutschlands, vol. 5, p. 71, pl. 3, fig. 91.
- Acalla ferrugana* var. (and/or aberration) *tripunctana*.—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palaearctischen Faunengebietes, vol. 2, p. 83, no. 1473a.—Kennel, 1907, in Spuler, Schmetterlinge Europas, vol. 2, p. 244; 1908, Die palaearctischen Tortriciden, p. 94, pl. 5, fig. 42.—Escherich, 1931, Forstinsekten Mitteleuropas, vol. 3, p. 220.
- ?*Alceris* [sic] *ferrugana* (in part).—Fernald, [1903], U. S. Nat. Mus. Bull. 52, p. 474, no. 5316, 1902.
- Peronea schalleriana* (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62; 1913, in Wytsman, Genera insectorum, fasc. 149, p. 62.
- Peronea ferrugana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 60; 1913, in Wytsman, Genera insectorum, fasc. 149, p. 62; 1927, Revised handbook of British Lepidoptera, p. 522.—?Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7413.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 21, pl. 8.—Filipjev, [1931], Ann. Mus. Zool. Acad. Sci. URSS, vol. 31, pp. 504-506, 508, 522, and 526; pls. 25 (fig. 3), 28 (fig. 3) 1930.—McDunnough 1934, Canadian Journ. Res., vol. 11, p. 321; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7513.—Sovinskij, 1937, Trav. Mus. Zool. (Kiev), vol. 19, p. 32, pls. 1 (figs. 1, 3, and 4); 2 (fig. 7).—Benander, 1950, Svensk Insektfauna, pt. 10, p. 21, text fig. 3k, pl. 1 (fig. 18).
- Acleris ferrugana* form *brachiana*.—Sheldon, 1931, The Ent., vol. 64, p. 61 (in part).
- Peronea ferrugana tripunctana*.—Lhomme, 1939, Catalogue des lépidoptères de France et de Belgique, vol. 2, pt. 2, p. 289.
- Acleris ferrugana*.—Wolff, 1952, Ent. Tidskr., vol. 73, p. 59.—Benander, 1954, Opuscula Ent. (Lund), vol. 19, p. 100, fig. 1d.

Acleris tripunctana.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 132 (synonymy and list of individual forms); 1957, Tijdschr. Ent., vol. 100, p. 327 (nomenclature and diagnostics).

This is the species usually treated in the literature as *ferrugana*. Because the true *ferrugana* Schiffermiller and Denis is another Palearctic species, known also as *fissurana* Pierce and Metcalfe, the name of the present species was replaced by *tripunctana* Hübner (Obraztsov, 1957). McDunnough (1934) mentioned two specimens of *tripunctana* (*ferrugana* auctorum) from Canada, the genitalia of which agreed with those of the European specimens of this species. In the markings of forewings, these specimens were similar to the figure 43 of Kennel (1908, pl. 5) which represents the aberration *galacteana* Krulikovskij of *tripunctana*.

The present author examined a male specimen from New Hampshire which undoubtedly belongs as an individual form to *tripunctana*. This form is not yet named, but is already known in Europe. The forewings are gray, speckled with dark gray, and have a large dark-gray costal spot. This form is somewhat similar to the Scandinavian *Acleris ferrumixtana* (Benander), but has the genitalia typical of *tripunctana*. The nominate form of *tripunctana* has forewings more or less brownish ochreous with a costal spot dark brown or black. It has not yet been recorded in the Nearctic region where *tripunctana* seems to be an introduced species and may therefore have a more limited number of individual forms than in the Palearctic region, of which it is native.

SPECIMEN EXAMINED.—One male (genitalia on slide 233-Obr.), Hampton, N. H., Oct. 23, 1906 (S. A. Shaw), AMNH.

Acleris tripunctana (Hübner) form *galacteana* Krulikovskij

Teras ferrugana (in part).—Fischer von Röslerstamm, 1836, Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde, p. 40, pl. 25, fig. 1c.

Acalla ferrugana aberration *galacteana* Krulikovskij, 1903, Rev. Russe Ent., vol. 3, p. 180.

Acalla ferrugana var. *tripunctana* (in part).—Kennel, 1908, Die palaearktischen Tortriciden, pl. 5, fig. 43.

Pcronea ferrugana.—McDunnough, 1943, Canadian Journ. Res., vol. 11, p. 321.

Acleris tripunctana aberration *galacteana*.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 132.

As noted above in the section on *tripunctana*, this individual form is known in the Nearctic region from Canada as one male from the Ottawa district and one female from Salt River, Northwest Territories (McDunnough, 1934).

TYPE.—Holotype, Urzhum, Kirov (Viatka) territory, Russia, in the Zoological Museum of the State University of Kiev.

Acleris cervinana (Fernald)

- Teras cervinana* Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 65.—Grote, 1882, New check list of North American moths, p. 57, no. 28.
- Alceris* [sic] *cervinana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 475, no. 5323, 1902.
- Peronea cervinana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7416.—Barnes and Buseck, 1920, Contr. Nat. Hist. Lep. North America, vol. 4, pl. 32, fig. 7.—Blackmore, 1921, British Columbia Prov. Mus. Rept., 1920, p. 24.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 483, 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 316, p. 328 (fig. 1), 332 (fig. 2); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7505.

The nominate form of *cervinana* was described as having the forewings "reddish fawn colored, touched with white along the costa." It has a dark brown costal spot with a white center, reaching to the middle of discal cell, and some tufts of dark brown raised scales in the discal cell, on the fold near the base of forewing and above this fold, and in the external part of forewing, where these tufts are arranged in an oblique line. In the form *americana* (see below!) the forewings should be "white, dimly reticulated with light red which is suffused along the borders." The costal spot of *americana* is dark red, composed of three parts touching each other. Two red lines originate from this spot, and run across the forewing. The tufts of black scales on the fold of forewings and over it, are similar to those of the nominate form of *cervinana*.

The present author saw only some few specimens corresponding completely to the diagnoses of the nominate form *cervinana* and form *americana*. Until a complete revision of the variation of this species is done, it seems reasonable to indicate all specimens with reticulation of forewings as form *americana*, to ignore the remaining characters of this form, and to treat all specimens without reticulation as form *cervinana*. Some specimens of these two forms have a solid costal spot; others have it formed by an arch or composed of three parts. The color of this spot varies from pale brown or gray to reddish, dark brown, or black. The lines originating from this spot may be well developed or lacking; sometimes only one of them is lacking, or one may be reduced in its lower part. The ground color of forewings varies from whitish gray or pale ochreous to gray and reddish brown; in some specimens the light ground is slightly touched with some of the above colors. In the form *americana*, the color of reticulation varies from pale brown to chestnut brown or almost black. McDunnough (1934) mentioned a specimen which cannot be identified with the nominate form of *cervinana* or with form *americana*.

The basal third of the forewing in this specimen is white, and the remainder is deep purple brown. The present author saw a female of this form from Wellington, British Columbia (May 15, G. W. Taylor; genitalia on slide 459-Obr.; AMNH), and another female from Hampton, N.H. (Mar. 31, 1905, S. A. Shaw; in the same collection), the latter with a well-developed dark-brown reticulation as in the form *americana*. This bicolored form is somewhat similar to "form a" of *britannia*, described in the present paper, and a form of *braunana*, mentioned by McDunnough (1934, p. 318).

FOOD PLANT.—As stated on the label on a female from Orono, Maine (Sept. 19, 1882; genitalia on slide, prepared by A. Busck, Dec. 12, 1924; in USNM), the food plant of *cervinana* is alder.

TYPE.—Lectotype (selected by the present author), male (genitalia on slide, prepared by A. Busck, Apr. 20, 1925), Cambridge (or ?Beverly), Mass., USNM.

Acleris cervinana (Fernald) form *americana* Fernald

Teras americana Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 66.—Grote, 1882, New check list of North American moths, p. 57, no. 29.—Moffat, 1887, Canadian Ent., vol. 19, p. 88.

Alceris (sic) *americana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 475, no. 5324, 1902.

Peronea americana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7421.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484, 1923.

Peronea cervinana (in part).—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 316.

Peronea cervinana form *americana*.—McDunnough, 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7505.

TYPE.—Lectotype (selected by the present author) male, Cambridge (or ?Beverly), Mass., USNM.

Acleris santacrucis, new species

PLATES 2 (FIG. 4), 9 (FIG. 29), 10 (FIGS. 32, 33)

Antennae, head, and thorax brownish ochreous. Labial palpi concolorous with the above, but much paler from inside. Forewings with costa slightly excavate before somewhat produced apex; termen slightly concave below apex. Ground of forewings ochreous with silky gloss; entire surface with brownish-ochreous reticulation consisting of numerous fine, chiefly transverse lines. Basal area (less than a quarter of wing length) separated by slightly darker brownish-ochreous fine convex line with minute groups of brownish-black raised scales on it. At about middle of costa, an elongate brownish spot oblique externad, reaching to below upper edge of discal cell and connected there to another similar costal spot situated externad and

oblique in opposite direction, the two spots forming a kind of triangle. From this connection, a rather broad brownish-ochreous fascia originates which reaches dorsum before tornus and is paler than the costal spots. Margins of both costal spots and fascia finely outlined by darker lines with small groups of brownish-black scales on them. A fine short brownish line at costa before wing apex, oblique basad. Two fine brownish-ochreous transverse lines between middle fascia and termen, hardly separable from lines of ground reticulation. Terminal line brown. Cilia ochreous. Reverse of forewings whitish ochreous; costa with traces of markings of upper surface, and fine short grayish lines; apex outlined by a brown terminal line. Length of forewing, 7-7.5 mm. Hind wings silky white, slightly yellowish at apex and cilia; in female with slight brownish-gray reticulation before apex and termen.

MALE GENITALIA.—Similar to those of *cervinana*, but with aedeagus somewhat thicker and its preapical thorn strongly curved caudad; three cornuti, more stout than in *cervinana*.

FEMALE GENITALIA.—Sterigma with lateral lobes broad and stout. Antrum well developed, subcylindrical, slightly narrowed caudad. Ductus bursae slightly sclerotized laterocaudad, then narrowed before a wide sack forming its cephalic portion. Signum stellate, scobinate.

TYPES.—Holotype, male (genitalia on slide, prepared by A. Busck, Feb. 10, 1933), Santa Cruz, Calif., Oct. 29, 1932 (Tilden); allotype, female (genitalia on slide 1-Obr., Jan. 28, 1959), taken together with holotype. Types in USNM (no. 65586).

REMARKS.—Externally this species may remind one of *Acleris rhombana* (Schifferrmiller and Denis), but it has a different wing shape and completely dissimilar genitalia. Those of the male of the new species are very close to the genitalia of *A. cervinana* (Fernald), but differ as mentioned above. In the female, the lateral lobes of the sterigma are broader than in *cervinana*; the antrum does not form any curvation of caudal angles; the sack of the ductus bursae is not narrowed caudad. From *A. subnivana* (Walker), which the new species resembles in having a sinuate costa of the forewings but no likeness in their markings, it differs by much longer cornuti and entirely distinct shapes of the sterigma and antrum.

Acleris comandrana (Fernald)

FIGURE 3

Teras comandrana Fernald, 1892, Canadian Ent., vol. 24, p. 121.

Acleris [sic] *comandrana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 475, no. 5326, 1902.

Peronea comandrana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal

America, p. 178, no. 7417.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484, 1923.—McDunnough, 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7506.

As with many other *Acleris* species, a description of *comandrana* based only on external characters gives almost no chance to recognize this species. The following new data upon the genitalia are filling up this gap, although there is no complete evidence that the male genitalia really belong to this species. Although the examined males are very close externally to the female type of *comandrana*, they originate from another locality, and this circumstance leaves some doubt about the conspecificity of the two sexes.

MALE GENITALIA.—Tegumen moderate, without cristae; gnathos with a strong hoodlike ventroapical projection; socii upright, elongate reniform, not reaching the top of tegumen. Valvae moderately wide; ventral margin of sacculus gently sinuate, with an elongate terminal hair tuft; brachiola broad. Aedoeagus slightly curved, rather stout, dilated cephalad; vesica with two pairs of almost equally sized thin cornuti and with a stout coniform apical cornutus.

FEMALE GENITALIA.—Sterigma rather broad, with short acute lateral lobes. Ostium bursae remote from cephalic margin of sterigma,

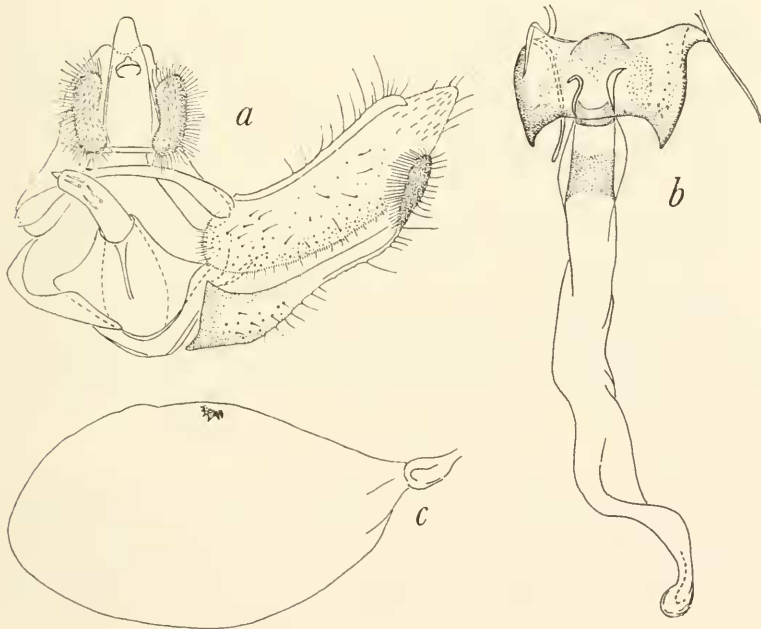


FIGURE 3.—*Acleris comandrana* (Fernald): *a*, male genitalia (Whitesbog, N.J., Oct. 30, 1916; slide prepared by A. Busck, Sept. 14, 1914; USNM); *b*, female genitalia, sterigma and ductus bursae (lectotype); *c*, corpus bursae (Pennsylvania; slide prepared by A. Busck, Sept. 10, 1924; USNM).

semicircular with caudal flaps turned cephalad. Antrum a moderate plate. Ductus bursae with a broad sclerotized girdle remote from antrum, forming together with cervix bursae a rather broad tube. Corpus bursae elongate; signum semistellate.

REMARKS.—The number of cornuti is the same as in *semiannula* or *implexana*, but instead of a sclerotized plate, a coniform apical cornutus is present. The female genitalia are rather similar to those of *implexana*, especially the shape of sterigma, but the ductus bursae have a sclerotization forming a complete girdle, and the signum is semistellate.

TYPE.—Lectotype (selected by the present author), female (genitalia on slide, prepared by A. Busck, Sept. 7, 1924), Amherst, Mass., USNM.

OTHER SPECIMENS EXAMINED.—Two males (genitalia on slides, prepared by A. Busck, Apr. 6 and Sept. 14, 1924), Whitesbog, N.J., July 7 and Oct. 30, 1916 (H. B. Scammel); one female (genitalia on slide, prepared by A. Busck, Sept. 10, 1924), Pennsylvania. All the above specimens in USNM.

FOOD PLANTS.—*Andromeda*; *Comandra*.

Acleris subnivana (Walker)

Penthina subnivana Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 28, p. 376.

Teras deflectana Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 283, pl. 7, fig. 71.—Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 211.—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, p. 413.

Rhacodia peculiaria Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 210, pl. 8, fig. 1.

Teras subnivana.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, vol. 4, p. 1, pl. 61, fig. 2.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 5.—Grote, 1882, New check list of North American moths, p. 57, no. 3.

Teras peculiaria.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 5.—Grote, 1882, New check list of North American moths, p. 57, no. 2.

Alceris [sic] *peculiariana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5300, 1902.

Alceris [sic] *subnivana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472 no. 5301, 1902.

Peronea subnivana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 69; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 65.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7443.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 483, 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 317, 328 (fig. 2), 332 (fig. 3); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7507.

Peronea peculiariana, Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 70; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 65.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7445.

Types.—Lectotype of *subnivana* (selected by the present author), male (without abdomen), Nova Scotia (Redman), BM. Lectotype of *deflectana* (selected by Klots, 1942), female, Pennsylvania, in the Academy of Natural Sciences of Philadelphia. Holotype of *peculiana*, Texas, in the Museum of Comparative Zoology.

Variation.—McDunnough (1934) noted in *subnivana* variation of the ground color of forewings, their reticulation in some specimens, and the triangular costal spot solid or interrupted by a pale patch. The present author can add that there are specimens of *subnivana* in which a slight pale brownish band, connecting the costal spot with the dorsum, is present. This band in two of the examined specimens is especially well developed and dark: in a female lectoparatype, without data, and a female from New Brighton, Pa., Oct. 19, 1902 (H. D. Merrick), both in AMNH. A female specimen (genitalia on slide, prepared by A. Busck, Oct. 10, 1924) from Vancouver Island (A. W. Hanham), in USNM, has pale ochreous forewings. The costal triangle is reduced to a gray minute dot representing the external part of this triangle. This dot is connected with tornus by a narrow ochreous line slightly darker than the ground. Instead of the inner part of the costal triangle, there is a pale brownish-ochreous median fascia reaching the dorsum at tornus. This fascia is very pale and almost obliterate in its lower section. The cilia of forewings are pale chestnut brown.

Acleris braunana (McDunnough), new combination

Peronea ferrugana.—Barnes and Busck (not Schiffermiller and Denis), 1920, Contr. Nat. Hist. Lep. North America, vol. 4, pl. 32, fig. 2.

Peronea braunana McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 317, 328 (fig. 3), 332 (fig. 4); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7508; 1942, Canadian Ent., vol. 74, p. 70.

Among the materials examined by the present author, there are a male specimen taken at Greenport, Long Island (Sept. 23, 1947, J. McDunnough; genitalia on slide 407—Obr.; AMNH), bred from grape, and a male specimen from Silverton, Colo. (genitalia on slide, prepared by A. Busck, May 10, 1935; USNM), bred from willow.

Acleris kearfottana (McDunnough), new combination

Peronea kearfottana McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 318, 328 (fig. 4), 332 (fig. 5); 1935, Canadian Ent., vol. 67, pp. 77 and 148; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7509; 1940, Canadian Ent., vol. 72, p. 61.

As an individual form not yet described, a female specimen from Hampton, N.H. (Apr. 26, 1908, S. A. Shaw; genitalia on slide 408—Obr.; AMNH), has to be mentioned here. The forewings are brownish gray, paler distad, with a dark costal patch and a diffuse fuscous shadow below it.

Acleris semiannula (Robinson), new combination

- Teras semiannula*.—Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 282, pl. 7, fig. 70.—Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 212.
- Teras ferrugana* var. *semiannula*.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.
- Teras ferrugana*.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 8 (in part).
- Alceris* [sic] *ferrugana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5316 (in part), 1902.
- Peronea ferrugana* (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 60; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7413.
- Peronea stadiana* Barnes and Busek, 1920, Contr. Nat. Hist. Lep. North America, vol. 4, p. 217.
- Peronea ferrugana* form *semiannula*.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 487, 1923.
- Peronea semiannula*.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 322, 328 (fig. 8), 332 (fig. 9); 1935, Canadian Ent., vol. 67, p. 148; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7514.

TYPES.—Holotype of *semiannula*, female, Pennsylvania, in the Academy of Natural Sciences of Philadelphia. Holotype of *stadiana*, male, Ottawa, Ontario, Sept. 18, 1905 (C. H. Young), USNM.

REMARKS.—As one of the characters of this species, McDunnough (1934) mentioned the presence of a pair of apical cornuti and of two more cornuti with a chitinous plate between them in the central part of vesica. In most of the examined specimens of *semiannula*, the present author observed the same, although the position of the plate was not always as above, but was sometimes at one side of two central cornuti. In one male specimen from Montclair, N.J. (Nov. 2, 1903, W. D. Kearfott; genitalia on slide 224-Obr.; AMNH), only one cornutus of the central group is present, but the remaining armature of the vesica is normal. There is a male specimen from New York (Big Indian Valley, Catskill Mountains, July 10, 1906, R. F. Pearsall; genitalia on slide 234-Obr.; AMNH) in which the number of cornuti is normal, but one cornutus in the central group is thinner and somewhat shorter than the other. This specimen has broad brownish-ochreous forewings, much more intensively colored than usual in *semiannula*. The markings of the forewings are also somewhat different, and there are some doubts about the systematic position of this specimen. Two males and two females from Essex County, N.J. (May, W. D. Kearfott; genitalia on slides 222-Obr., 223-Obr., and 231-Obr.; AMNH), reared from *Betula alba*, have forewings colored similarly to those of the specimen from New York. The forewings are shorter and relatively broader than in the common form of *semiannula*, but the genitalia do not differ in any way from those of this species. Should it be confirmed that the food plant of

semiannula is maple (McDunnough, 1934) and that the moths reared from this plant always have elongate forewings, the short-winged form from birch might receive a separate name.

Acleris implexana (Walker), new combination

PLATE 10 (FIG. 34)

Sciaphila implexana Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 28, p. 338.

Acleris heindelana Fernald, 1905, Amer. Nat., vol. 39, p. 870. New synonym.

Peronea heindelana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 64; 1913, in Wytsman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7429.

Peronea heindeliana [sic].—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 483, 1923.

Peronea gallicolana form *heindelana*.—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 323; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7515.

Peronea hudsoniana (in part).—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 312; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7500.

A genitalia examination of the type specimen of "*Sciaphila*" *implexana* in the British Museum showed definitely that this species has nothing in common with *A. hudsoniana* (Walker) with which McDunnough (1934) placed it as a synonym. There is no doubt that *implexana* is the same species which McDunnough called *gallicolana*.

McDunnough treated *heindelana* as a form of *gallicolana* Clemens. The female lectotype of *heindelana* in the United States National Museum corresponds well to the type of *implexana*. Unfortunately, no indubitable proof of what the true *gallicolana* is can be cited, because the type specimen lacks an abdomen. A specimen in Fernald's collection (USNM), labeled "*Teras gallicolana* Cl. Comp[are]d with Rob[in]-s[on] type," might seem to disaffirm McDunnough's conception of this species. The genitalia of this specimen correspond to those of the species described by McDunnough as *braunana*. There is, however, no reason to give any preference to Fernald's identification of *gallicolana* over McDunnough's conception of this species. Fernald based his "homotype" on its superficial similarity to the type of *gallicolana*; McDunnough came to his conclusion on the basis of the original description of this species. Both authors might be equally right or mistaken, because they did not compare the genitalia of their specimens with those of the type of *gallicolana*. But, because this comparison cannot be done and there are no other ways to prove the identity of the type of *gallicolana*, the present author is inclined to follow McDunnough's conception of this species, the more so because

McDunnough published his point of view and Fernald did not. Inasmuch as *implexana* (= *heindelana*) is the nominate form of the species, *gallicolana* must be treated as its individual form.

TYPES.—Holotype of *implexana*, female (genitalia on slide 5355), St. Martins Falls, Albany River, Hudsons Bay, Canada, 1844 (Barnston), BM. Lectotype of *heindelana* (selected by the present author), female (genitalia on slide, prepared by A. Busck, May 22, 1924), Winnipeg, Manitoba (A. W. Hanham), USNM.

Acleris implexana (Walker) form *gallicolana* Clemens, new status

Peronea gallicolana Clemens, 1864, Proc. Ent. Soc. Philadelphia vol. 3, p. 516.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 323, 328 (fig. 9), 332 (fig. 10); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7515; 1942, Canadian Ent., vol. 74, p. 70—Darlington, 1947, Trans. Amer. Ent. Soc., vol. 73, p. 103.

Teras gallicolana.—Walker, 1866, List of the specimens of lepidopterous insects in the British Museum, pt. 35, p. 1779.

Teras ferrugana (in part).—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 8. *Acleris* [sic] *ferrugana* (in part).—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5316, 1902.

Peronea ferrugana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7413.

TYPE.—Lectotype (selected by Darlington, 1947), male (without abdomen), no data, in the Academy of Natural Sciences of Philadelphia.

Acleris schalleriana viburnana (Clemens)

Peronea viburnana Clemens, 1860, Proc. Acad. Nat. Sci. Philadelphia, p. 347.—Darlington, 1947, Trans. Amer. Ent. Soc., vol. 73, p. 103.

Teras viburnana.—Walker, 1864, List of the specimens of lepidopterous insects in the British Museum, pt. 30, p. 983.—Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 281, pl. 7, fig. 66.—Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 214.

Teras logiana (in part).—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7.—Grote, 1882, New check list of North American moths, p. 57, no. 14.

Teras logiana var. *viburnana*, Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 8.—Grote, 1882, New check list of North American moths, p. 57, no. 14.

Acleris [sic] *logiana* (in part).—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5312, 1902.

Acleris [sic] *logiana viburnana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5312a, 1902.

Peronea logiana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 65; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7423.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 485, 1923.

Peronea logiana var. (or form) *viburnana*.—Mosher, 1916, Bull. Illinois State Lab. Nat. Hist., vol. 12, p. 57.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7423.

Peronca schalleriana.—McDunnough (not Linné), 1934, Canadian Journ. Res., vol. 11, pp. 297, 325 (fig. 9), 329 (fig. 9); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7479.

Acleris schalleriana aberration *viburnana* (in part).—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 134.

McDunnough (1934) found that the North American specimens of *schalleriana* do not differ in any marked respect from the European forms of this species, the variation of which is shown in Kennel's (1908, pl. 4, figs. 34–38) figures. A large series of moths of this species from North America, examined by the present author and compared with the European specimens, has distinctly shown that the variation of *schalleriana* is quite distinct in both parts of the Holarctic region, and the Nearctic population deserves a separation as a subspecies. The form *viburnana*, which is predominant in North America, although it reminds one somewhat of the European form *falsana* Hübner (*germarana* Frölich), differs from it in having the forewings more elongate, with the ground color from pearl gray to deep grayish ochreous and markings darker. Especially typical of *viburnana* is the tendency of the costal spot of forewings to divide and form a separate middle fascia and a comparatively small outer part of costal spot between this fascia and the wing apex. This small fragment of the costal spot is usually connected with the tornus by a fine line. In the true *falsana*, not yet known from North America, the middle fascia can be observed rather as an exception, although it is common in the form *plumbosana* Haworth, known from both Europe and North America. In this latter form, synonymous with *famula* Zeller, the forewings are more rotundate, more or less shaded with yellowish externad. The North American specimens of *schalleriana* forewings darkened and markings indistinct, might be identified with the form *castaneana* Haworth, although there is some difference between them and the European specimens of this form. The latter have no markings at all because the markings of the European specimens of *schalleriana* are considerably paler than those of the North American *viburnana*, and they are thus not seen on a dark ground.

TYPE.—Lectotype of *viburnana* (selected by Darlington, 1947), female (without abdomen), "131" (7254, type), in the Academy of Natural Sciences of Philadelphia.

OTHER SPECIMENS EXAMINED.—One female (genitalia on slide 545-Obr.), Maxton, N.C., Nov. 29, 1943 (A. B. Klots), AMNH. One male and one female (genitalia on slides, prepared by A. Busck, Oct. 20 and Nov. 11, 1923), Hyattsville, Md., Sept. 30, 1907 (A. Busck); one female (genitalia on slide, prepared by A. Busck, May 8, 1935), Whitesbog, N.J., Jan. 2, 1914 (H. B. Scammel); USNM. One

female (genitalia on slide 232-Obr.), Hampton, N.H., Apr. 10, 1909 (S. A. Shaw), AMNH. Many other specimens from New Jersey, Pennsylvania, and New Hampshire.

Acleris schalleriana viburnana (Clemens) form *castaneana* Haworth

Tortrix castaneana Haworth, 1811, *Lepidoptera Britannica*, p. 410.

Peronea plumbosana.—Wood (not Haworth), 1839, *Index entomologicus*, p. 158, pl. 36, fig. 1082.

Peronea plumbana [sic].—Westwood and Humphreys, 1845, *British moths and their transformations*, vol. 2, p. 160, pl. 95, fig 4.

Teras violaceana Guenée, 1845, *Ann. Soc. Ent. France*, ser. 2, vol. 3, p. 146; [1846], *Europaecorum Microlepidopterorum index methodicus*, p. 12, 1845.—Bruand, 1847, *Men. Soc. Émul. Doubs*, *Catalogue des microlépidoptères . . . Doubs*, p. 35.—de Joannis, 1919, *Ann. Soc. Ent. France*, vol. 88, p. 5.

Peronea (*Acleris*) *plumbosana* (in part).—Stephens, 1852, *List of the specimens of British animals in the British Museum*, pt. 10, p. 19.

Teras tristana (in part).—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 208.

Teras mixtana (in part).—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 208.

Acalla mixtana (in part).—Rebel, 1901, in *Staudinger and Rebel, Catalog der Lepidopteren des palaearetischen Faunengebietes*, vol. 2, p. 81, no. 1451.

Peronea logiana (in part).—Barrett, 1905, *Lepidoptera of the British Islands*, vol. 10, p. 228.—Meyrick, 1912, in *Wagner, Lepidopterorum catalogus*, pt. 10, p. 65; 1913, in *Wytsman, Genera insectorum*, fasc. 149, p. 64.

Peronea logiana var.—Barrett, 1905, *Lepidoptera of the British Islands*, vol. 10, pl. 453, fig. 3.

Acalla logiana form *germarana* (in part).—Kennel, 1908, *Die palaearktischen Tortriciden*, p. 78.

Acalla logiana aberration *plumbosana* Kennel, 1908, *Die palaearktischen Tortriciden*, pl. 4, fig. 38.

Peronea mixtana (in part).—Meyrick, 1912, in *Wagner, Lepidopterorum catalogus*, pt. 10, p. 65; 1913, in *Wytsman, Genera insectorum*, fasc. 149, p. 64.

Peronea logiana variety *famula*.—Forbes (not Zeller), [1924], *Cornell Univ. Agr. Exp. Stat. Mem.* 68, p. 485, 1923.

Peronea schalleriana form *castaneana*.—Sheldon, 1930, *The Ent.*, vol. 63, p. 198.

Acleris schalleriana aberration *castaneana*.—Obratsov, 1956, *Tijdschr. Ent.*, vol. 99, p. 134.

TYPES.—Type of *castaneana* (cf. Sheldon, 1930), England, BM. Type of *violaceana* (cf. Joannis, 1919), in the *Museum National d'Histoire Naturelle* (Paris).

SPECIMENS EXAMINED.—One male (genitalia on slide 182-Obr.), Montclair, N.J., Nov. 2, 1903 (W. D. Kearfott); one male (genitalia on slide 578-Obr.), Oak Station, Allegheny County, Penn., Nov. 21, 1905 (F. Marloff); one male (genitalia on slide 240-Obr.), Hampton, N.H., June 27, 1908 (S. A. Shaw); one male (genitalia on slide 440-Obr.), Framingham, Mass., Oct. 8, 1905; AMNH. Many other specimens from the above states and North Carolina.

Acleris schalleriana viburnana (Clemens) form *plumbosana* Haworth

- Tortrix plumbosana* Haworth, 1811, *Lepidoptera Britannica*, p. 415.
- Peronea plumbosana*.—Curtis, 1824, *British entomology*, expl. pl. 16.—Stephens, 1829, *Systematic catalogue of British insects*, vol. 2, p. 186, no. 7079; 1834, *Illustrations of British entomology*, *Haustellata*, vol. 4, p. 158.
- Teras logiana* (in part).—Treitschke, 1830, *Schmetterlinge von Europa*, vol. 8, p. 262.
- Peronea boscana*.—Wood (not Fabricius), 1839, *Index entomologicus*, p. 158, pl. 36, fig. 1083.
- Teras erutana* Herrich-Schäffer, 1847, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, *Tortricides*, p. 2, fig. 9; 1851, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, p. 143.
- Peronea (Acleris) plumbosana*.—Stephens, 1852, *List of the specimens of British animals in the British Museum*, pt. 10, p. 19.
- Peronea (Acleris) boscana*.—Stephens, 1853, *List of the specimens of British animals in the British Museum*, pt. 10, p. 19 (in part).
- Teras rufana* (in part).—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 211.
- Teras logiana* aberration *plumbosana*.—Wocke, 1871, in Staudinger and Wocke, *Catalog der Lepidopteren des europäischen Faunengebiets*, p. 233, no. 657b.
- Teras tristana* (in part).—Zeller, 1875, *Verhandl. zool.-bot. Ges. Wien*, vol. 25, p. 214.
- Teras tristana* var. *famula* Zeller, 1875, *Verhandl. zool.-bot. Ges. Wien*, vol. 25, p. 214.—Walsingham, 1879, *Illustrations of typical specimens of Lepidoptera Heterocera*, pt. 4, p. 76.
- Teras logiana* var. *famula*.—Fernald, 1882, *Trans. Amer. Ent. Soc.*, vol. 10, p. 8.—Grote, 1882, *New check list of North American moths*, p. 57, no. 14.
- Acalla logiana* aberration (or form) *germarana* (in part).—Rebel, 1901, in Staudinger and Rebel, *Catalog der Lepidopteren des palaearktischen Faunengebietes*, vol. 2, p. 81, no. 1452a.—Kennel, 1908, *Die palaearktischen Tortriciden*, pl. 4, figs. 36, 37.
- Acleris* [sic] *logiana famula*.—Fernald, [1903], *U.S. Nat. Mus. Bull.* 52, p. 474, no. 5312b, 1902.
- Peronea logiana* (in part).—Barrett, 1905, *Lepidoptera of the British Islands*, vol. 10, p. 228.—Meyrick, 1912, in Wagner, *Lepidopterorum catalogus*, pt. 10, p. 65; 1913, in Wytzman, *Genera insectorum*, fasc. 149, p. 64.
- Peronea logiana* var. —Barrett, 1905, *Lepidoptera of the British Islands*, vol. 10, pl. 453, fig. 3a.
- Peronea logiana famula*.—Barnes and McDunnough, 1917, *Check list of the Lepidoptera of Boreal America*, p. 178, no. 7423.
- Peronea logiana* variety *viburnana*.—Forbes (not Clemens), [1924], *Cornell Univ. Agr. Exp. Stat. Mem.* 68, p. 485, 1923.
- Peronea schalleriana* form *plumbosana*.—Sheldon, 1930, *The Ent.*, vol. 63, p. 198.
- Peronea schalleriana* (in part).—McDunnough, 1934, *Canadian Journ. Res.*, vol. 11, p. 297; 1939, *Mem. Southern California Acad. Sci.*, vol. 2, p. 58, no. 7479.
- Acleris schalleriana* aberration *plumbosana*.—Obraztsov, 1956, *Tijdschr. Ent.*, vol. 99, p. 134.
- Acleris schalleriana* aberration *famula*.—Obraztsov, 1956, *Tijdschr. Ent.*, vol. 99, p. 134.
- Acleris schalleriana* aberration *erutana*.—Obraztsov, 1956, *Tijdschr. Ent.* vol. 99, p. 134.

Acleris schalleriana aberration *viburnana* (in part).—Obratsov, 1956, Tijdschr. Ent. vol. 99, p. 134.

TYPES.—Type of *plumbosana* (cf. Sheldon, 1930), England, BM. Location of the type specimen of *erutana* is unknown. Lectotype of *famula* (selected by the present author), female (genitalia on slide, prepared by A. Busck, Dec. 6, 1929), no data, USNM.

SPECIMENS EXAMINED.—Many reared specimens in AMNH, probably from New Jersey.

Acleris variegana (Schiffmiller and Denis)

- Phalaena* (*Tortrix*) *variegana* Schiffmiller and Denis, 1775, Ankündigung eines systematischen Werkes von den Schmetterlingen der Wiener Gegend, p. 130; 1776, Systematisches Verzeichniss der Schmetterlinge der Wiener Gegend, p. 130.—Gmelin, 1788, Systema naturae, ed. 13, vol. 1, pt. 5, p. 2512.—Villers, 1789, Caroli Linnaei entomologia . . ., vol. 4, p. 523.—Illiger, 1801, Systematisches Verzeichniss von den Schmetterlingen der Wiener Gegend, vol. 2, p. 60.
- Pyralis variegana*.—Fabricius, 1787, Mantissa insectorum, vol. 2, p. 228; 1794, Entomologia systematica, vol. 3, pt. 2, p. 254.
- Pyralis abildgaardana* Fabricius, 1794, Entomologia systematica, vol. 3, pt. 2, p. 274.—Zincken, 1821, in Charpentier, Die Zinsler, Wickler, Schaben und Geistchen des Systematischen Verzeichnisses der Schmetterlinge der Wiener Gegend, p. 60.
- Cristana*.—Hübner (not Schiffmiller and Denis), 1796–1799, Sammlung europäischer Schmetterlinge, Tortrices, pl. 10, fig. 55. (uninominal).
- Phalaena* (*Tortrix*) *cristana*.—Illiger, 1801, Systematisches Verzeichniss von den Schmetterlingen der Wiener Gegend, vol. 2, p. 57.
- Tortrix variegana*.—Laspeyres, 1805, Illiger's Mag. Insektenkunde, vol. 4, p. 13.—Haworth, 1811, Lepidoptera Britannica, p. 414.—Charpentier, 1821, Die Zinsler, Wickler, Schaben und Geistchen des Systematischen Verzeichnisses der Schmetterlinge der Wiener Gegend, p. 70.—Werneburg, 1864, Beiträge zur Schmetterlingskunde, vol. 2, p. 201.
- Tortrix blandiana* Charpentier, 1821, Die Zinsler, Wickler, Schaben und Geistchen des Systematischen Verzeichnisses der Schmetterlinge der Wiener Gegend, p. 98.
- Eutrachia cristana*.—Hübner, 1822, Systematisch-alphabetisches Verzeichniss, p. 60.
- Eclectis blandana* Hübner, 1825, Verzeichniss bekannter Schmettlinge [sic], p. 385.
- Tortrix abildgaardana*.—Frölich, 1828, Enumeratio Tortricum Württembergiae, p. 19.
- Teras abildgaardana*.—Treitschke, 1829, Schmetterlinge von Europa, vol. 7, p. 229; 1830, Schmetterlinge von Europa, vol. 8, p. 268; 1835, Schmetterlinge von Europa, vol. 10, pt. 3, pp. 137 and 262.—Guenée, 1845, Ann. Soc. Ent. France, ser. 2, vol. 3, p. 144; [1846], Europaeorum Microlepidopterorum index methodicus, p. 10, 1845.—Zeller, 1847, Isis, p. 739.—Lederer, 1859, Wiener Ent. Monatschr., vol. 3, p. 152.
- Peronca variegana*.—Stephens, 1829, Systematic catalogue of British insects in the British museum, vol. 2, p. 187, no. 7087.—Curtis, post 1834, British entomology, expl. pl. 16, p. 7.—Wood, 1839, Index entomologicus, p. 159, pl. 36, fig. 1089.—Duponchel, 1845, Catalogue méthodique des lépidoptères d'Europe, p. 291.—Westwood and Humphreys, 1845, British moths and

- their transformations, vol. 2, p. 161, pl. 95, fig. 13.—Wilkinson, 1859, British tortricides, p. 175.—Barrett, 1905, Lepidoptera of the British Islands, vol. 10, p. 232, pl. 454, fig. 2.—Meyrick, 1912, *in* Wagner, Lepidopterorum catalogus, pt. 10, p. 63; 1913, *in* Wytzman, Genera insectorum, fasc. 149, p. 63, pl. 5, fig. 68; 1927, Revised handbook of British Lepidoptera, pp. 519, 524.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 23, pl. 9.—Blackmore, 1923, British Columbia Prov. Mus. Rept. for 1922, p. 27; p. 34, pl. 6.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484, 1923.—Sheldon, 1931, The Ent., vol. 64, p. 2.—McDunnough, 1935, Canadian Ent., vol. 67, p. 148; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7489.—Lhomme, 1939, Catalogue des lépidoptères de France et de Belgique, vol. 2, p. 293.—Benander, 1950, Svensk Insektfauna, pt. 10, p. 17, pl. 1, fig. 14.
- Peronea (Acleris) variegana*.—Stephens, 1834, Illustrations of British entomology, Haustellata, vol. 4, p. 160; 1852, List of the specimens of British animals, pt. 10, p. 18.
- Peronea abildgaardana*.—Duponchel, 1835, Histoire naturelle des lépidoptères ou papillons de France, vol. 9, p. 159, pl. 244, fig. 4.
- Tortrix (Teras) abildgaardana*.—Herrich-Schäffer, 1851, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, p. 141.
- Teras variegana*.—Wocke, 1861, *in* Staudinger and Wocke, Catalog der Lepidopteren Europa's, p. 94, no. 563.—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 27, p. 209.—Heinemann, 1863, Schmetterlinge Deutschlands und der Schweiz, Abth. 2, vol. 1, pt. 1, p. 20.—Wocke, 1871, *in* Staudinger and Wocke, Catalog der Lepidopteren des europäischen Faunengebiets, p. 233, no. 660.—Millière, 1874, Mém. Soc. Sci. Nat. Cannes, vol. 4, p. 69.—Snellen, 1882, Vlinders van Nederland, Microlepidoptera, p. 175.—Sorhagen, 1886, Kleinschmetterlinge der Mark Brandenburg, p. 64.
- Acala variegana*.—Meyrick, 1895, Handbook of British Lepidoptera, p. 523.—Rebel, 1901, *in* Staudinger and Rebel, Catalog der Lepidopteren des palaearktischen Faunengebietes, vol. 2, p. 81, no. 1455.—Kennel, 1907, *in* Spuler, Schmetterlinge Europas, vol. 2, p. 243, pl. 83, fig. 14; 1908, Die palaearktischen Tortriciden, p. 85, pl. 5, figs. 11–13.
- Acleris variegana*.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 135.—Bradley, 1956, Ent. Gaz., vol. 7, p. 154, pl. 8.—Swatschek, 1958, Larvalsystematik der Wickler, p. 76.

SPECIMENS EXAMINED.—One male and one female (genitalia on slides, prepared by A. Busck, Nov. 15, 1922, and Feb. 4, 1924), Victoria, British Columbia, Sept. 8 and 12, 1922 (E. H. Blackmore), and many other specimens from the same locality; USNM.

Acleris variegana (Schiffmiller and Denis) form *asperana* Fabricius

- Pyralis asperana* Fabricius, 1776, Genera insectorum, p. 292; 1781, Species insectorum, vol. 2, p. 284; 1787, Mantissa insectorum, vol. 2, p. 234; 1794, Entomologia systematica, vol. 3, pt. 2, p. 269.
- Tortrix osbeckiana* Thunberg and Borgstroem, 1784, Dissertationes entomologicae, vol. 1, p. 19, pl. 3, fig. 21; 1801, Dissertationes academicae, vol. 3, p. 31, pl. 3, fig. 21.
- Phalaena (Tortrix) asperana*.—Gmelin, 1788, Systema naturae, ed. 13, vol. 1, pt. 5, p. 2510.—Villers, 1789, Caroli Linnaei entomologia . . ., vol. 2, p. 409.

- Phalaena (Tortrix) osbeckiana*.—Gmelin, 1788, *Systema naturae*, ed. 13, vol. 1, pt. 5, p. 2516.
- Tortrix asperana*.—Haworth, 1811, *Lepidoptera Britannica*, p. 414.
- Nyctemerana* Hübner, 1814–1817, *Sammlung europäischer Schmetterlinge*, Tortrices, pl. 38, fig. 240 (uninominal).
- Eutrachia nyctemerana*.—Hübner, 1822, *Systematisch-alphabetisches Verzeichniss*, p. 63.
- Eclectis nyctemerana*.—Hübner, 1825, *Verzeichniss bekannter Schmettlinge* [sic], p. 385.
- Tortrix variegana* β .—Frölich, 1828, *Enumeratio tortricum Württembergiae*, p. 20.
- Peronea asperana*.—Stephens, 1829, *Systematic catalogue of British insects* vol. 2, p. 187, no. 7086.—Curtis, post 1834, *British entomology*, expl. pl. 16, p. 7.—Duponchel, 1835, *Histoire naturelle des lépidoptères ou papillons de France*, vol. 9, p. 161, pl. 244, fig. 5.—Wood, 1839, *Index entomologicus*, p. 159, pl. 36, fig. 1088.—Westwood and Humphreys, 1845, *British moths and their transformations*, vol. 2, p. 161, pl. 95, fig. 9.
- Peronea (Acleris) asperana*.—Stephens, 1834, *Illustrations of British entomology*, *Haustellata*, vol. 4, p. 160; 1852, *List of the specimens of British animals in the British Museum*, pt. 10, p. 18.
- Teras nyctemerana*.—Treitschke, 1835, *Schmetterlinge von Europa*, vol. 10, pt. 3, p. 262.—Guenée, 1845, *Ann. Soc. Ent. France*, ser. 2, vol. 3, p. 144; [1846], *Europaeorum Microlepidopterorum index methodicus*, p. 10, 1845.
- Tortix (Teras) nyctemerana*.—Herrich-Schäffer, 1851, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 4, p. 142; 1856, *Systematische Bearbeitung der Schmetterlinge von Europa*, vol. 6, p. 155.
- Peronea (Acleris) osbeckiana*.—Stephens, 1852, *List of the specimens of British animals in the British Museum*, pt. 10, p. 18.
- Peronea aspersana* [sic].—Westwood (not Hübner), 1852, *in* Wood, *Index entomologicus*, ed. 2, p. 159, pl. 36, fig. 1088. Wilkinson, 1859, *British tortrices*, p. 176.
- Tortrix abildgaardana*.—Werneburg (not Fabricius), 1858, *Stettiner Ent. Zeit.*, vol. 19, p. 425.
- Peronea variegana* (in part).—Stainton, 1859, *Manual of British butterflies and moths*, vol. 2, p. 234, fig.—Barrett, 1905, *Lepidoptera of the British Islands*, vol. 10, pl. 454, fig. 2a.—Meyrick, 1912, *in* Wagner, *Lepidopterorum catalogus*, pt. 10, p. 63; 1913, *in* Wytzman, *Genera insectorum*, fasc. 149, p. 63.
- Teras variegana* (in part).—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 209.
- Teras variegana* aberration *asperana*.—Wocke, 1871, *in* Staudinger and Wocke, *Catalog der Lepidopteren des europaischen Faunengebiets*, p. 233, no. 660a.
- Acalla variegana* aberration *asperana*.—Rebel, 1901, *in* Staudinger and Rebel *Catalog der Lepidopteren des palaearktischen Faunengebietes*, vol. 2, p. 81, no. 1455a.—Kennel, 1908, *Die palaearktischen Tortriciden*, p. 86, pl. 5, fig. 14.
- Peronea variegana* form *asperana*.—Sheldon, 1931, *The Ent.*, vol. 64, p. 5.—Lhomme, 1939, *Catalogue des lépidoptères de France et de Belgique*, vol. 2, p. 294.
- Peronea variegana* form *nyctemerana*.—Sheldon, 1931, *The Ent.*, vol. 64, p. 5.
- Acleris variegana* aberration *asperana*.—Obraztsov, 1956, *Tijdschr. Ent.*, vol. 99, p. 135.

SPECIMENS EXAMINED.—Many specimens, Victoria, British Columbia (W. R. Carter and E. H. Blackmore); one female, Labrador; USNM. One male (genitalia on slide 446—Obr.), Berkeley, Calif., Oct. 15, 1940 (F. H. Rindge); three males (genitalia of one on slide 447—Obr.), San Mateo, Calif., June 1 and 3, 1941 (G. E. Pollard); AMNH.

Acleris logiana placidana (Robinson), new combination and status

Teras placidana Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 282, pl. 7, fig. 69.—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, p. 415.

Teras parisiana.—Walsingham (not Guenée), 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.

Teras scabrana.—Fernald (not Schiffermiller and Denis), 1882, Trans. Amer. Ent. Soc., vol. 10, p. 5.—Grote, 1882, New check list of North American moths, p. 57, no. 5.

Teras niveana.—Fernald (not Fabricius), 1882, Trans. Amer. Ent. Soc., vol. 10, p. 6.—Grote, 1882, New check list of North American moths, p. 57, no. 6.

Acleris [sic] *boseana*.—Fernald (not Fabricius), [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5303, 1902.

Acleris [sic] *boseana parisiana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5303a, 1902.

Acleris [sic] *niveana*; Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5304, 1902.

Peronea niveana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7441.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484, 1923.

Peronea boseana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7444.

Peronea boseana parisiana.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7444a.

Peronea trisignana.—Forbes (not Robinson), [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 483, 1923.

Peronea logiana.—McDunnough (not Clerck), 1934, Canadian Journ. Res., vol. 11, pp. 314, 327 (fig. 5), 331 (fig. 7); 1939, Mem. Southern California Acad. Sci. vol. 2, p. 59, no. 7503.

The North American population of *logiana* is distinguished by the prevalence of grayish, sometimes rather dark-colored specimens very rare in Europe. This circumstance gives reason to treat this population as a separate subspecies; however, although the name *placidana* was based on a white specimen which does not differ much from the European common form, there is no choice but to apply this name for the entire North American subspecies of *logiana*, until the gray variety receives a separate name. A form with three black dots representing fragments of a costal spot is known as form *trisignana* Robinson; *trisignana* was described also from a white specimen, and there are gray specimens too with this character.

The subspecies *placidana* and its varieties are known to the present author from the states of Washington, Idaho, Virginia, New York-New Jersey, Pennsylvania, and Maine, and in Canada from British Columbia, Alberta, Ontario, and Quebec.

TYPE.—Lectotype (selected by Klots, 1942), female, no other label data but "Type 7409"; in the Academy of Natural Sciences of Philadelphia.

Acleris logiana placidana (Robinson) form *trisignana* Robinson

Teras trisignana Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 282, pl. 7, fig. 69.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 5.—Grote, 1882, New check list of North American moths, p. 57, no. 4.

Acleris [sic] *trisignana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5302, 1902.

Peronea niveana (in part).—Barrett, 1905, Lepidoptera of the British Islands, vol. 10, pl. 451, fig. 5a.—Benander, 1950, Svensk Insektafauna, pt. 10, pl. 1, fig. 13.

Acalla niveana var. *scotana*.—Kennel (not Stephens), 1908, Die palaearktischen Tortriciden, p. 88, pl. 5, fig. 20.

Peronea trisignana.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 62; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7422.

Oxigraha logiana form *tripunctana* Sheldon, 1931, The Ent., vol. 64, p. 103.

Peronea logiana form *trisignana*.—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 315; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7503.

Acleris logiana aberration *trisignana*.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 137.

TYPES.—Lectotype of *trisignana* (selected by Klots, 1942), male, West Virginia, AMNH. Type of *tripunctana*, Forres, Scotia (unknown to the present author).

Acleris senescens (Zeller), new combination

PLATE 4 (FIG. 12)

Teras senescens Zeller, 1874, Verhandl. zool.-bot. Ges. Wien, vol. 24, p. 431.

Teras nigrolinea (in part).—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 6.—Grote, 1882, New check list of North American moths, p. 57, no. 7.

Acleris [sic] *nigrolinea*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5305 (in part), 1902.

Peronea nigrolinea (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 66; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7435.—Buseck, 1931, Bull. Brooklyn Ent. Soc., vol. 26, p. 210, pl. 12, fig. 17.

Peronea senescens.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 300, 326 (fig. 2), 330 (fig. 2); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7483.

Types.—Lectotype (selected by the present author), male, Vancouver Island, Canada: paratypes, one male ("var. B") and one female, the same data. All in BM.

REMARKS.—McDunnough (1934) wrote about the variation of this species, and noted a form with a black streak from base to apex of forewing. A male specimen from Half Moon Bay, Calif. (Feb. 6, 1940, W. H. Lange; genitalia on slide 3—Obr., Feb. 16, 1959; USNM), examined by the present author, belongs to an interesting individual form not yet described and corresponding to the form *psorana* Frölich of *Acleris scabrana* (Schiffmiller and Denis) of the Palearctic fauna. The forewings of this form of *senescens* are pale gray, with a pale pinkish-brown discal cell. Instead of a broad middle fascia, an incomplete black zigzag line is present. A fine black ray runs along the lower edge of discal cell, from the base of forewing to slightly below the apex, and becomes obliterate behind the discal cell. A fine short black line, parallel to this ray and above it, is present in the apical part of the forewing. Another black line, along the anal vein, reaches slightly beyond the transverse zigzag line.

Acleris hastiana (Linné)

Phalaena Tortrix hastiana Linné, 1758, *Systema naturae*, ed. 10, p. 532; 1761, *Fauna Suecica*, ed. altera, p. 346; 1767, *Systema naturae*, ed. 12, vol. 1, pt. 2, p. 878.—Clerck, 1759, *Icones insectorum*, pl. 2, fig. 7. Gmelin, 1788, *Systema naturae*, ed. 13, vol. 1, p. 2508.—Villers, 1789, *Caroli Linnaei entomologia* . . . , vol. 2, p. 398.

Pyralis hastiana.—Fabricius, 1774, *Systema entomologiae*, p. 650; 1781, *Species insectorum*, vol. 2, p. 282; 1787, *Mantissa insectorum*, vol. 2, p. 230; 1794, *Entomologia systematica*, vol. 3, pt. 2, p. 261.

Teras hastiana.—Treitschke, 1830, *Schmetterlinge von Europa*, vol. 8, p. 266.—Guenée, 1845, *Ann. Soc. Ent. France*, ser. 2, vol. 3, p. 144; [1846], *Europaeorum Microlepidopterorum index methodicus*, p. 10, 1845.—Lederer, 1859, *Wiener Ent. Monatschr.*, vol. 3, p. 151.—Wocke, 1861, in Staudinger and Wocke, *Catalog der Lepidopteren Europa's*, p. 94, no. 553; 1871, in Staudinger and Wocke, *Catalog der Lepidopteren des europaeischen Faunengebiets*, p. 232, no. 652.—Walker, 1863, *List of the specimens of lepidopterous insects in the British Museum*, pt. 27, p. 207.—Heinemann, 1863, *Schmetterlinge Deutschlands und der Schweiz*, Abth. 2, vol. 1, pt. 1, p. 14.—Millière, 1874, *Mém. Soc. Sci. Nat. Cannes*, vol. 4, p. 68.—Snellen, 1882, *Vlinders van Nederland, Microlepidoptera*, p. 177.—Fernald, 1882, *Trans. Amer. Ent. Soc.*, vol. 10, p. 6.—Grote, 1882, *New check list of North American moths*, p. 57, no. 11.

Peronea coronana.—Wood (not Thunberg), 1839, *Index entomologicus*, p. 157, pl. 35, fig. 1072.

Teras scabrana.—Guenée (not Schiffmiller and Denis), 1845, *Ann. Soc. Ent. France*, ser. 2, vol. 3, p. 145; [1846], *Europaeorum Microlepidopterorum index methodicus*, p. 11, 1845.

?*Rhyacionia hastiana*.—Westwood and Humphreys, 1845, *British moths and their transformations*, vol. 2, p. 173, pl. 99, fig. 15.

- Peronea (Eclectis) hastiana*.—Stephens, 1852, List of the specimens of British animals in the British Museum, pt. 10, p. 14.
- Peronea hastiana*.—Wilkinson, 1859, British tortrices, p. 171.—Stainton, 1859, Manual of British butterflies and moths, vol. 2, p. 233.—Barrett, 1905, Lepidoptera of the British Islands, vol. 10, p. 224.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 67; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64; 1923, The Ent., vol. 56, p. 162; 1927, Revised handbook of British Lepidoptera, p. 526.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7439.—Sheldon, 1923, The Ent. vol. 56, pp. 75, 100, 149, and 271; 1927, Proc. Ent. Soc. London, vol. 2, p. 1; 1930, The Ent., vol. 63, p. 148.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 485 (in part), 1923.—Filipjev, [1930], Ann. Mus. Zool. Acad. Sci. URSS, vol. 30, p. 509, pl. 41, figs. 1 and 3, 1929; [1931] Ann. Mus. Zool. Acad. Sci. URSS, vol. 31, p. 516, pls. 23 (figs. 3 and 3a, b), 28 (fig. 6), 1930.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 301, 326 (fig. 3); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7484.—Lhomme, 1939, Catalogue des lépidoptères de France et de Belgique, vol. 2, p. 300.—Vari, 1944, Ent. Berichten, vol. 11, p. 216, figs. 1, 2.—Obraztsov, 1949, Mitt. Münchener Ent. Ges., vol. 35–39 (“1945–1949”), p. 211.—Benander, 1950, Svensk Insektafauna, pt. 10, p. 12, text fig. 3a, pl. 1 (figs. 2, 3).
- Teras pulverosana* Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 28, p. 291.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 3, pl. 61, fig. 7.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7.—Grote, 1882, New check list of North American moths, p. 57, no. 12. New synonym.
- Tortrix scabrana*.—Werneburg (not Schiffermiller and Denis), 1864, Beiträge zur Schmetterlingskunde, vol. 1, p. 548.
- Teras hastiana* aberration *coronana*.—Wocke (not Thunberg), 1871, in Staudinger and Wocke, Catalog der Lepidopteren des europaischen Faunengebiets, p. 232, no. 652a.
- Teras pastiana* [sic].—Murtfeldt, 1893, Insect life, vol. 5, p. 155.
- Acalla hastiana*.—Meyrick, 1895, Handbook of British Lepidoptera, p. 521.—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palaearktischen Faunengebietes, vol. 2, p. 80, no. 1446.—Kennel, 1908, Die palaearktischen Tortriciden, p. 70, pl. 3, fig. 33.—Krulikovskij, [1908], Rev. Russe Ent., vol. 7, p. 104, 1907.—Müller-Rutz, 1924, Mitt. Schweizerischen Ent. Ges., vol. 13, p. 348.—Petersen, 1924, Lepidopteren-Fauna von Estland, pp. 335 and 417.—Dufrane, 1933, Lambillionea, vol. 33, p. 196, 1 pl.—Benander, 1934, Ent. Tidskr., vol. 55, p. 122, pl. 1, fig. 4.
- Teras hastianum*.—Reutti, 1898, Uebersicht der Lepidopteren-Fauna des Grossherzogthums Baden, ed. 2, p. 209.
- Acalla hastiana* aberration *coronana* (in part).—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palaearktischen Faunengebietes, vol. 2, p. 80, no. 1446a.—Kennel, 1908, Die palaearktischen Tortriciden, p. 71.
- Alceris* [sic] *hastiana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5309, 1902.—Fracker, 1915, Illinois Biol. Monogr., vol. 2, no. 1, p. 74.
- Alceris* [sic] *pulverosana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5310, 1902.
- Peronea pulverosana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 64; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7428.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp.

302, 326 (fig. 5), 330 (fig. 4); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7486.

Eclectis hastiana.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 18, pl. 7 (genitalia of female, not those of male); 1935, Genitalia of the tineid families, p. 114.

Peronea maccana.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 21, pl. 8 (genitalia of male, not those of female).

Acleris hastiana.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 137; 1957, Tijdschr. Ent. vol. 100, p. 330 (synonymy and list of individual forms).

McDunnough (1934) applied the name *pulverosana* to some specimens from Canada, although with some doubts. The present author has no objection to this application of the above name, because the external characters of the specimens with the genitalia of McDunnough conception of *pulverosana* correspond quite well to the type of this species. McDunnough treated *pulverosana* as a separate species, but, as he wrote himself, the genitalic distinction between it and *hastiana* is minimal, and the females of the two species cannot be satisfactorily differentiated. The socii of the male genitalia *pulverosana* are less distinct distally and more nearly circular in outline, the aedeagus is slightly longer and narrower, and the armature of the vesica consists of three cornuti. In both *pulverosana* and *hastiana*, a triangular piece of chitin is present in the armature of the vesica.

The latter character seems to the present author to be of special taxonomic significance when considering *pulverosana* and *hastiana* as being conspecific. The number of cornuti varies in *hastiana* from three to six (Obraztsov, 1949); even in some Canadian specimens of *hastiana*, there are only three cornuti present, as in *pulverosana*. In the European specimens of *hastiana*, many of which were examined by the present author, the cornuti vary in their thickness and length. The shape of the socii is also inconstant in large series of *hastiana*, and some European specimens have nearly circular socii. Inasmuch as in Manitoba both *pulverosana* and *hastiana* are present, there is no reason to suppose in *pulverosana* a geographical subspecies of *hastiana*, and it should be treated as an individual form. Until a revision of individual variation of *hastiana* in North America is done, *pulverosana* becomes a synonym of *hastiana*.

The present author examined some specimens which belong in all probability to *hastiana* but which have no cornuti. In a series from Watsonville, Calif. (September 1919, D. Penny; genitalia on slides 1—Obr., 2—Obr., and 3—Obr., Jan 5, 1959; in USNM), consisting of three males, one specimen only has four minute dots of the vesica, which show the places on which the cornuti were fixed. There is also a male specimen without cornuti from Verdi, Nev. (June 20–30, A. H. Vachell; genitalia on slide 434—Obr.; AMNH).

In redescription of *celiana* Robinson, McDunnough (1934, p. 302) wrote that the red-brown tufting of the thorax is apparently lacking in *hastiana*. The present author had at hand many specimens of *hastiana*, especially from Europe, in which a red-brown tuft was well developed.

Types.—Lectotype of *hastiana* (selected by Sheldon, 1923), figured by Clerck, 1759, *Icones insectorum*, pl. 2, fig. 7. Holotype of *pulverosana*, female (without abdomen), St. Martins Falls, Albany River, Hudsons Bay, Canada, 1844 (Barnston), BM. Walker erroneously indicated this specimen as male.

Acleris walkerana (McDunnough), new combination

PLATES 9 (FIG. 30), 10 (FIG. 35)

Peronea walkerana McDunnough, 1934, *Canadian Journ. Res.*, vol. 11, pp. 303, 326 (fig. 6), 330 (fig. 5); 1939, *Mem. Southern California Acad. Sci.*, vol. 2, p. 58, no. 7487; 1942, *Canadian Ent.*, vol. 74, p. 70.

Peronea caryosphena Meyrick, 1937, *Exotic Microlepidoptera*, vol. 5, p. 157.—McDunnough, 1939, *Mem. Southern California Acad. Sci.*, vol. 2, p. 58, no. 7488.—Lesse and Viette, 1946, *Ann. Soc. Ent. France*, vol. 115, p. 90, figs. 10 and 14. New synonym.

Through the kindness of Dr. Pierre E. L. Viette (Muséum National d'Histoire Naturelle, Paris), the present author had an opportunity to study *Peronea caryosphena*, described by E. Meyrick from Greenland. The examined series consisted of two males and two females taken in Greenland in 1949 and identified by Dr. Viette. The moths vary considerably, and some have almost unicolorous gray forewings. The antemedian band and groups of raised scales are typical of fresh specimens which, in addition, have the forewings slightly powdered with pale-grayish scales. In the genitalia, the specimens from Greenland do not differ from *Peronea walkerana* described by J. McDunnough from Ontario and Quebec.

The male genitalia of *walkerana* resemble those of *Acleris hastiana* (Linné), but they differ from them in the shape of some parts. The cristae of the tegumen of *walkerana* are strongly reduced, the anal spine of the gnathos is stronger than that of *hastiana*, and the angle before half of the sacculus is more pointed. The length of the cornuti and the shape of the socii are rather inconstant in both of these species. The female genitalia give a solid basis for distinguishing *walkerana* and *hastiana*.

SPECIMENS EXAMINED.—One female paratype of *walkerana* (genitalia on slide P. 43a), Aylmer, Quebec, Apr. 25, 1924 (C. H. Curran), USNM. Two males and two females (genitalia on slides 1-Obr. and 2-Obr.), western Greenland, 69° 45' E., Aug. 22–25, 1949 (Mission P. E. Victor H. de Lesse, 1949), in the Muséum National d'Histoire Naturelle, Paris.

Acleris robinsoniana (Forbes), new combination

Teras flavivittana.—Robinson (not Clemens), 1869, Trans. Amer. Ent. Soc., vol. 2, p. 280, pl. 7, fig. 61.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7 (in part).

Acleris [sic] *hastiana flavivittana* (in part).—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5309b, 1902.

Peronea hastiana (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 68.

Peronea robinsoniana Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 487, 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 304, 326 (fig. 7), 330 (fig. 6); 1939 Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7490.

Peronea robinsonana [sic].—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, p. 394 and 415.

Forbes (1924) gave a short description of this species, believing that it was already published by Kearfott, and supposed it a probable variety of the European *Acleris permutana* (Duponchel). He did not mark with his labels any specimen of the type series of *robinsoniana* in the American Museum of Natural History, and McDunnough (1934) was the first who selected ten specimens in that collection as cotypes of this species. These specimens correspond well with Forbes' original description of *robinsoniana*. Klots (1942) found it logical not to restrict the type material of *robinsoniana* to the ten specimens selected by McDunnough as "cotypes," but to treat all 83 specimens, placed under this name in the Kearfott Collection, as the type lot, inasmuch as Forbes did not select any preferred specimens. Although not all these "lectoparatypes" (as Klots called them) belong to the nominate form of *robinsoniana*, the present author completely agrees with Klots' proposal, especially in view of the fact that McDunnough's selection was rather arbitrary because his "cotypes" did not include all the specimens which correspond to the nominate form of this species. There are nine more specimens of the nominate form of *robinsoniana* in the type lot used by Forbes for his description, and these specimens were not indicated by McDunnough as "cotypes." Even though, in consequence of the proposal of Klots, the type series of *robinsoniana* became somewhat "motley" because of the many varieties which it includes, the lectotype selected by Klots is completely typical of the nominate form of this species. The entire type lot of *robinsoniana* in the American Museum of Natural History includes the following forms.

Form a, nominate form

Forewings along dorsum with a pale-yellow streak slightly widened externad; remainder brown, darker basad and apicad.

TYPES.—Lectotype of *robinsoniana* (selected by Klots, 1942), male, Hampton, N.H., Apr. 29, 1907 [not 1909!] (S. A. Shaw); 19 paratypes

from the same locality, Aweme, Manitoba (N. Criddle), and Holly Beach, N.J., March 7, 1900 (F. Hainbach).

OTHER SPECIMEN EXAMINED.—One female (genitalia on slide 425-Obr.), Red Rock Lake, Whiteshell Forest Reserve, Manitoba, June 6, 1954 (C. D. Bird).

Form b

Forewings reddish brown; a minute discal dot and very fine lines (some along vein A_{2+3} , one or two at wing apex, and sometimes some at lower margin of discal cell and cubital veins), white.

SPECIMENS EXAMINED.—Nine specimens (among them eight paratypes of *robinsoniana*), Hampton, N.H. (S. A. Shaw).

Form c

As the form *b*, but with a broad whitish transverse fascia before middle of forewing.

SPECIMEN EXAMINED.—One male (paratype of *robinsoniana*), Hampton, N.H. (S. A. Shaw).

Form d

Forewings brownish ochreous with an obliterate dark-brown costal spot and a blackish spot in basal part of wing.

SPECIMENS EXAMINED.—Seven specimens (paratypes of *robinsoniana*), Hampton, N.H. (S. A. Shaw).

Form e

The most common variety described by McDunnough (1934). Color and maculation as in *Acleris inana* (Robinson).

SPECIMENS EXAMINED.—Forty specimens (paratypes of *robinsoniana*; genitalia of two males and one female on slides 212-Obr., 571-Obr., and 572-Obr.), Hampton, N.H. (S. A. Shaw), and Aweme, Manitoba (N. Criddle).

Form f

Forewings blackish brown; a spot in discal cell, and ternal part of wing, ochreous. This form received a separate name, and is known as form *clemensiana* Forbes (see below).

Acleris robinsoniana (Forbes) form *clemensiana* Forbes

Peronea clemensiana Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 487, 1923.—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, pp. 394 and 413.

Peronea robinsoniana form *clemensiana*.—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 304; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7490.

As with the nominate form of *robinsoniana*, Klots (1942) also changed the number of the specimens of *clemensiana* in the collection

of the American Museum of Natural History that should be treated as lectoparatypes, and selected the lectotype. The present author concurs with this proposal of Klots.

TYPES.—Lectotype (selected by Klots, 1942), male, Hampton, N.H., Oct. 27, 1908 (S. A. Shaw); nine paratypes, the above locality, and Montclair, N.J., Feb. 1, 1903 (W. D. Kearfott). The entire type series in AMNH.

OTHER SPECIMENS EXAMINED.—Six specimens (paratypes of *rob-insoniana*), Hampton, N.H. (S. A. Shaw), AMNH.

***Acleris britannia* Kearfott**

Acleris britannia Kearfott, 1904, Canadian Ent., vol. 36, p. 138.—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, p. 413.

Peronea britannia.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7414.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 306, 326 (fig. 10) 330 (fig. 9); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7493.

Acleris [sic] *britannia*.—Fracker, 1915, Illinois Biol. Monogr., vol. 2, no. 1, p. 74.

In the original description of this species, Kearfott indicated as its type a specimen in the U.S. National Museum ("type no. 7784"). The specimen in the American Museum of Natural History, selected for a lectotype (Klots, 1942), is, therefore, merely a paratype. An examination of the male genitalia of *britannia* has showed that they differ a little from those of McDunnough's (1943) figure in having the sacculus before its emargination more acute and the subapical spine of the aedocagus somewhat longer. The number of cornuti in this species probably varies because in one male there are only three cornuti instead of four arranged in two pairs. The female genitalia of *britannia* are quite accurately figured by McDunnough.

TYPES.—Holotype ("type no. 7784"), male (genitalia on slide, prepared by A. Busck, Apr. 21, 1935), Kaslo, British Columbia (Dyar, no. 39083); paratype, female (genitalia on the same slide), same data (Dyar, no. 27985); both in USNM. Paratype ("lectotype" of Klots, 1942), female (genitalia on slide 206-Obr.; this specimen was listed by Klots, 1942, as male), same data (N. Criddle; Dyar, no. 21082), AMNH.

REMARKS.—Besides the nominate form redescribed by McDunnough (1934), the present author examined two individual forms of *britannia*, very striking and looking like two separate species, but in the genitalia not differing from *britannia*. Pending a revision of the variation of this species, these two forms are described below without names.

Form a

PLATE 2 (FIG. 6)

Basal part, a little less than half of forewing, white or yellowish with a brown short oblique streak or triangle at dorsum, and black well-developed raised scales on this streak; entire external part of forewing brown or yellowish brown with a slightly darker obliterate costal triangle. Some small groups of black raised scales at border of these two so differently colored areas. Some interrupted blackish transverse (in external part of forewing, oblique) lines crossing both areas. Costa of forewing with gray obliterate lines and minute dots. Hind wing grayish white with slight dark reticulation.

At first sight, this form may remind one of *Acleris variegana* (Schifferrmiller and Denis). Although all known specimens of this form originate from the State of Washington, it does not represent there a constant subspecies. The nominate form of *britannia* is also known from this state.

SPECIMENS EXAMINED.—State of Washington: one male (genitalia on slide 6097, prepared by J. F. Gates Clarke, Nov. 7, 1934), Puyallup, Pierce County, Aug. 20, 1930 (T. C. Clarke); one male, Toledo, Lewis County, Aug. 5, 1931 (J. F. Gates Clarke); three males (genitalia of one on slide 1—Obr., Feb. 25, 1959), Bonneville, Clark County, July 15–16, 1931 (J. F. Gates Clark); all specimens in USNM.

Form b

PLATE 2 (FIG. 5)

Forewing yellowish brown, with a slightly darker indistinct costal triangle and black raised scales arranged as in former variety. A tuft of whitish raised scales on discocellulars. Some dark transverse lines well developed in external part of forewing. Hind wing grayish white with gray reticulation.

SPECIMEN EXAMINED.—One female (genitalia on slide, prepared by A. Busck, Oct. 11, 1924), Biological Station, Departure Bay, British Columbia, Aug. 5, 1909 (A. W. Hanham), USNM.

***Acleris klotsi*, new species**

FIGURE 4; PLATE 3 (FIGS. 7, 8)

Head, labial palpi, thorax, and forewings whitish ochreous. Antennae concolorous, with darker annulation. Abdomen pale grayish. Forewings with three parallel oblique ochreous bands almost equally spaced: first from about one-quarter of costa to one-third of dorsum, second from about middle of costa to two-thirds of dorsum, third from three-quarters of costa to tornus. Upper part of second band somewhat darker, connected by a line with third band below costa,

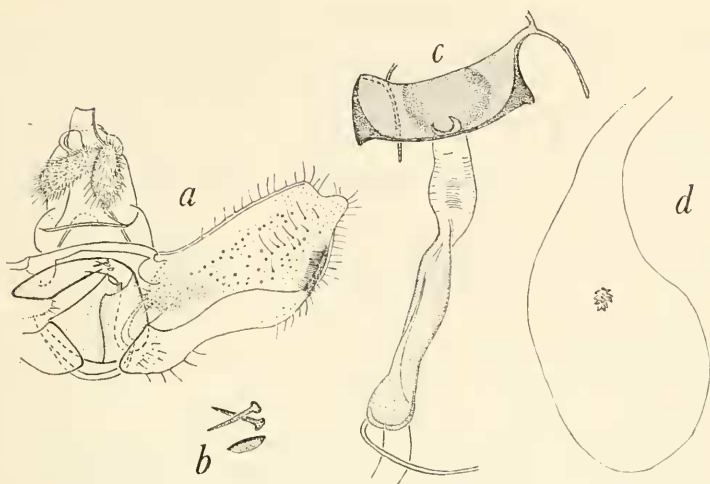


FIGURE 4.—*Acleris klotsi*, new species: *a*, male genitalia (paratype; slide 179-Obr.); *b*, cornuti (more enlarged); *c*, female genitalia (allotype).

an obliterate costal triangle thus formed. Groups of black raised scales easily falling off: one on first band between discal cell and dorsum, five others along second band. An obliterate ochreous shadow between two external bands, and a similar narrow line parallel to third band, between it and termen. Cilia whitish ochreous with a brownish basal line. Reverse of forewings paler than their upper surface, with brownish-gray dots and short lines matching markings of upper surface. Length of forewing, 7–8 mm. Hind wings white.

MALE GENITALIA.—Tegumen without cristae; gnathos simple without middle spine; socii ovate. Valvae elongate; brachiola indicated by a slight obtuse projection; sacculus rather broad, sinuate; external tuft narrow. Aedeagus strongly curved; vesica armed with a semioval plate and two cornuti capitate at base.

FEMALE GENITALIA.—Sterigma with very short lateral lobes. Antrum narrow, semilunar, pointing caudad. Ductus bursae rather long, semimembranous and narrow in long cephalic portion, dilated and membranous caudad. Cervix bursae moderate; corpus bursae slightly elongate; signum stellate, scobinate, somewhat elongate.

TYPES.—Holotype, male, Ramsay Canyon, Huachuca Mountains, Ariz., July 10–15, 1941 (A. B. Klots); allotype, female (genitalia on slide 180-Obr.), the same data; three male paratypes (genitalia of one on slide 179-Obr.). All types in AMNH.

REMARKS.—In its appearance this new species has no close resemblance to any Nearctic *Acleris* species, although it might perhaps remind one of *A. britannia* Kearfott, in which however the forewing markings are probably never so obliterate. The genitalia are very

typical of the new species, and separate it well from all known *Acleris* species.

Acleris maculidorsana (Clemens)

- Cnephasia* ? *maculidorsana* Clemens, 1864, Proc. Ent. Soc. Philadelphia, vol. 3, p. 516.
- Teras maculidorsana*.—Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 281, pl. 7, fig. 64.—Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 213.—Moffat, 1887, Canadian Ent., vol. 19, p. 88.
- Teras hastiana* var. *maculidorsana*.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7.—Grote, 1882, New check list of North American moths, p. 57, no. 11.
- Alceris* [sic] *hastiana maculidorsana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5309d, 1902.
- Peronea hypericana* Ely, 1910, Proc. Ent. Soc. Washington, vol. 12, p. 68.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7418.
- Peronea maculidorsana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 64; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 63.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7431.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 486, 1923.—McDunnough, 1934, Canadian Journ. Res. vol. 11, pp. 310, 327, (fig. 10), 331 (fig. 2); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7497; 1940, Canadian Ent., vol. 72, p. 60.—Darlington, 1947, Trans. Amer. Ent. Soc., vol. 73, p. 103.

On the basis of examination of two genitalia slides, McDunnough (1934) wrote about the armature of the vesica of *maculidorsana* that it consists in this species of a bundle of small cornuti, variable in number (8 to 12 in the specimens examined by McDunnough). In six slides of the male genitalia of *maculidorsana* examined by the present author, the cornuti form two groups, one basal and one distal, distinctly separated one from the other. Only in one specimen (Whitesbog, N.J.) was this separation not clearly seen, perhaps because of an inappropriate position of the aedocagus on the slide. The basal group of the cornuti consists of two rather stout, almost equally sized needles; they were seen also in the above specimen from Whitesbog. Judging from the examined slides, the number of the cornuti in the distal group varies from six to eight. These cornuti are thinner and about $1\frac{1}{2}$ times as long as the basal ones. On the figure published by McDunnough (1934, p. 327, fig. 10), these two groups of the cornuti are seen quite distinctly, although the difference of their lengths is not shown. It should also be mentioned that the apical spine of the vesica (the so-called "rose-thorn") was directed inward toward the aedocagus tube in all the examined slides.

SPECIMENS EXAMINED.—One male (genitalia on slide 422-Obr.), Red Rock Lake, Whiteshell Forest Reserve, Manitoba, May 13, 1954

(C. D. Bird), AMNH. One male (genitalia on slide 458-Obr.), Montclair, N.J., Nov. 2, 1903 (W. D. Kearfott), AMNH. One male (genitalia on slide, prepared by A. Busck, May 8, 1935), Whitesbog, N.J., Dec. 1, 1914 (H. B. Scammell), USNM. One male (genitalia on slide, prepared by A. Busck, May 7, 1935), Fishers Falls, Pa., Apr. 28, 1884, in USNM. Two males (genitalia on slides 215-Obr. and 216-Obr.), Hampton, N.H., Oct. 20, 1907, and Oct. 28, 1908 (S. A. Shaw), AMNH.

Acleris clarkei, new species

FIGURE 5; PLATE 4 (FIGS. 10, 11)

Antennae dark gray and whitish annulated. Head and thorax whitish gray, latter with a brownish-black margin cephalad. Labial palpi white from inner side and below, dark gray from outer surface; their terminal joint dark gray. Forewings brownish black in two basal thirds, with an incurved outer edge of this area; two whitish costal patches on this ground, incompletely divided by black; sometimes indistinct, whitish spots at dorsum in external part of dark

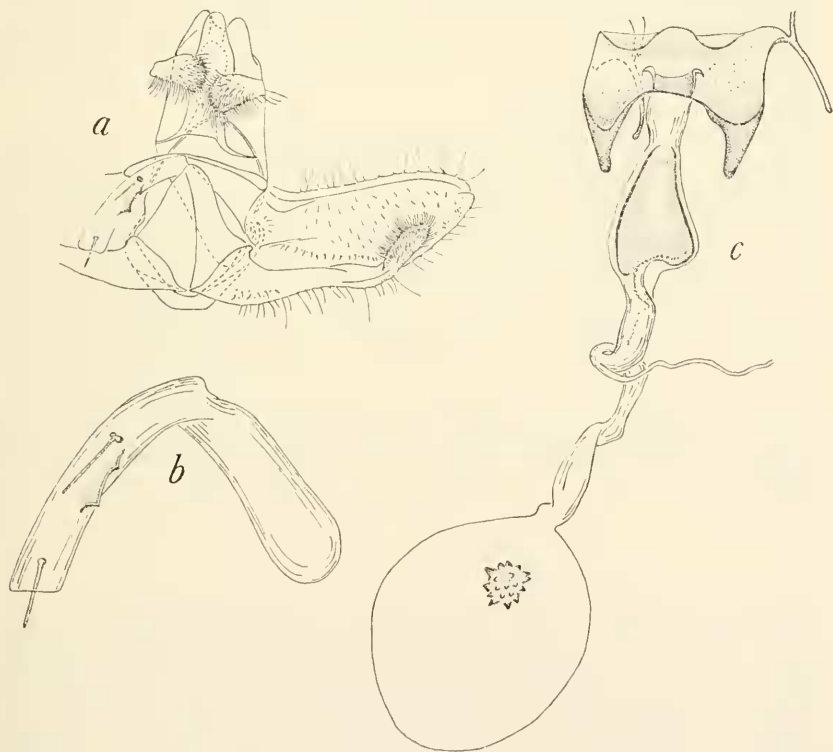


FIGURE 5.—*Acleris clarkei*, new species: *a*, male genitalia (holotype); *b*, cornuti (more enlarged); *c*, female genitalia (paratype).

area, and a slight indication of transverse lines. Outer third of forewing brownish gray-white, irregularly crossed by narrow, slightly oblique, interrupted blackish lines. Terminal line narrow, blackish. Cilia concolorous with outer part of forewing. Length of forewing, 7-8 mm. Hind wings smoky white; cilia white.

MALE GENITALIA.—Tegumen moderate; gnathos smooth; socii band-like, rather broad. Valvae elongate; brachiola slightly indicated; sacculus somewhat concave at middle; external tuft rather broad. Aedoeagus geniculate, with a bicuspidate carina on outer surface; vesica with two rather long cornuti capitate at their bases.

FEMALE GENITALIA.—Sterigma with moderately long, parallel coniform lateral lobes rotundate at tips. Antrum subrectangular with caudal angles curved laterocephalad. Ductus bursae moderately long, dilated, and sclerotized at middle. Cervix bursae moderate; corpus bursae rotundate with a large stellate scobinate signum.

TYPES.—Holotype, male (genitalia on slide, prepared Nov. 5, 1934, by J. F. Gates Clarke), Cle Elum, Kittitas County, Wash., Apr. 9, 1931 (J. F. Gates Clarke); allotype, female, Aweme, Manitoba, Apr. 18, 1905 (N. Criddle); one male (without abdomen) and one female (genitalia on slide 1-Obr., Jan. 12, 1959), paratypes, Aweme, Manitoba, Aug. 24, 1907, and Apr. 19, 1908 (N. Criddle). All the above types in USNM (no. 65587).

REMARKS.—In its appearance this species resembles no other known *Acleris* species, and might perhaps remind one rather of an *Apotomis* or *Endothenia* species. The form of the socii is somewhat similar to that in the *Acleris hastiana* group, but the sculpture of the outer surface of the aedoeagus is perhaps unique in the entire genus *Acleris*. The female genitalia of the new species are rather close to those of *cervinana* and *subnivana*, and they differ from them in the shape of the antrum.

This new species is named for Dr. J. F. Gates Clarke, of the U.S. National Museum, who directed the attention of the present author to this and some other *Acleris* species in the collection of the above museum.

Acleris capizziana, new species

FIGURE 6, a ; PLATE 1 (FIGS. 2, 3)

MALE.—Antennae gray with blackish obliterate annulation more distinct apicad. Head gray with scales dark patched at middle and white edged apicad; some pinkish-brown scales at head sides. Labial palpi above concolorous with head, below and at inside cream white. Patagia and tegulae gray with scales whitish edged distad. Thorax gray, distinctly darker than head. Forewings gray with pinkish-brown obliterate irregular markings formed by an area at base of

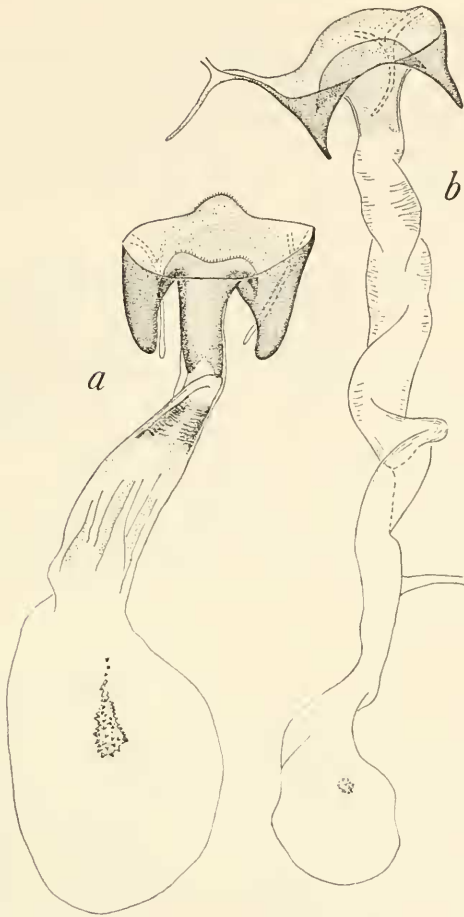


FIGURE 6.—Female genitalia of two *Acleris* species: *a*, *A. capizziana*, new species; *b*, *A. incognita*, new species.

costa, an oblique precostal line at middle, an angulate precostal line instead of a regular costal triangle before wing apex, some preterminal dots, and a diffuse darkening dorsad from discal cell. Small groups of brown to black raised scales: two in discal cell, one above its last third, and one below its basal third. Some minute dark dots along veins of discal cell and in other parts of wing. Cilia concolorous with head. Length of forewing, 10 mm. Hind wings smoky white. Foretibiae and tarsi pinkish brown above.

FEMALE.—Antennae, head, labial palpi, patagia, tegulae, and thorax as in male. Forewings whitish gray to gray with dark pinkish-brown markings formed by an area at base of costa, a short precostal oblique line in first third wing, a broader and longer precostal oblique line at

wing middle, connected with a concolorous flat costal triangle reaching to wing apex, and a rather broad terminal line. Most of supradorsal area below discal cell darkened with brown. Some concolorous dots in discal cell and other parts of wing. Small inconstant groups of black raised scales around discal cell. Cilia concolorous with head or somewhat paler. Length of forewing, 9–10 mm. Hind wings pale smoky.

MALE GENITALIA.—Unknown.

FEMALE GENITALIA.—Sterigma with long broad lateral lobes rotundate at tips and slightly bent inward apically. Ostium bursae broad, sinuate. Antrum a broad sclerotized tube, slightly longer than lateral lobes of sterigma, dilated caudad, excavate cephalad; angles of antrum laterad from ostium bursae bent cephalad and rather long. Bursa copulatrix with a broad cervix sclerotized caudad; its corpus ovate. Signum elongate, scobinate, narrowed caudad.

TYPES.—Holotype, female (genitalia on slide 2-Obr., Feb. 16, 1959), Bendon, Oreg., Sept. 24, 1956 (J. Capizzi); allotype, male, and two female paratypes, taken together with holotype. All the above types in USNM (no. 65588).

FOOD PLANT.—All four examined specimens were reared from strawberry.

REMARKS.—The abdomen of the single male specimen was received preprepared, glued to a piece of paper, with the genitalia missing. Externally this male is somewhat similar to *Acleris lipsiana* (Schiffenmiller and Denis), but has obliterate markings of forewings that are lacking in the latter species. The females might remind one somewhat of *Acleris maccana* (Treitschke) aberration *leporinana* Zetterstedt (Kennel, 1908, pl. 4, fig. 20), although they do not match its markings exactly. The female genitalia of the new species are similar to those of *lipsiana*, but the antrum is shorter and broader, and the ductus seminalis is joined to the ductus bursae remote from the antrum; in *lipsiana* the ductus seminalis opens directly cephalad from the antrum. The new species is named for its collector.

Acleris incognita, new species

FIGURE 6,b; PLATE 3 (FIG. 9)

MALE.—Unknown.

FEMALE.—Head dark brownish gray with scales white edged. Labial palpi concolorous with head, their inner side whitish. Thorax dark brownish gray. Forewings concolorous with head, but scales not white edged. Base of costa, a large obliterate costal patch over middle of discal cell and a longitudinal streak in this latter, last quarter of wing and some of external veins brown scaled. Groups of

yellowish raised scales forming distinct patches: one in basal part of discal cell, and three in its distal part. Some less distinct groups of raised scales on costal patch and below discal cell, some above dorsum. Cilia gray with tips of scales paler. Reverse of forewings brownish gray with some obliterate yellowish patches along costa. Length of forewing, 10.5 mm. Hind wings pale grayish white.

FEMALE GENITALIA.—Sterigma with long, rather thin, almost vertical lateral lobes. Antrum sclerotized, elongate rectangular, dilated caudad, with caudal edge crescent, pointing cephalad. Membranous portion of ductus bursae long, broad, equally wide along its entire length. Signum stellate, scobinate.

TYPE.—Holotype, female (genitalia on slide 2—Obr., Dec. 31, 1958), Moscow Mountains, Idaho, Aug. 7, 1933 (J. F. Gates Clarke). In USNM (no. 65589).

FOOD PLANT.—*Alnus* species (corresponding to the data on label).

REMARKS.—Externally this species could easily have been taken for some dark unicolorous specimen of *Acleris hastiana* (Linné), but in the female genitalia it entirely differs from that species, and resembles rather *A. lipsiana* (Schifferrmiller and Denis) and *A. apiciana* (Hübner). The antrum of *incognita* is much shorter than in the two latter species, and the lateral lobes of the sterigma are much narrower and are distinctly pointed.

Acleris minuta (Robinson)

- Tortrix minuta* Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 276, pl. 6, fig. 49.
Tortrix vacciniivorana Packard, 1870, in 17th Ann. Rept. Sec. Massachusetts Board Agr., p. 241; 1870, Injurious insects, p. 9.
Tortrix malivorana Le Baron, 1871, in 1st Ann. Rept. Noxious Insects Illinois, for 1870, p. 20.—Riley, 1872, in Board Agr., 4th Ann. Rept. Noxious, Beneficial and Other Insects . . . of Missouri, p. 47.
Teras variolana Zeller, 1875, Verhandl. zool.-bot. Ges. Wien, vol. 25, p. 212.
Teras minuta.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 9.—Grote, 1882, New check list of North American moths, p. 57, no. 24.
Teras vacciniivorana.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 9.—Grote, 1882, New check list of North American moths, p. 57, no. 23.
Teras malivorana.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 9.—Grote, 1882, New check list of North American moths, p. 57, no. 22.
Acleris [sic] *minuta*.—Fernald, [1903], Bull. U.S. Nat. Mus. 52, p. 475, no. 5319, 1902.—Fracker, 1915, Illinois Biol. Monogr., vol. 2, no. 1, p. 74.
Peronea minuta.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera Insectorum, fasc. 149, p. 62.—Mosher, 1916, Illinois State Lab. Nat. Hist. Bull. 12, p. 57, pls. 21 (fig. 41), 22 (figs. 42–43).—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7419.—Forbes, [1924], Cornell Univ. Agr. Exp. Sta. Mem. 68, p. 482, 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 314, 327 (fig. 7), 331 (fig. 8); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7502.

The variation of the nominate form of *minuta* is rather insignificant, but there are specimens with forewings somewhat darker than have usually been observed. The hind wings are pale grayish, as a rule, but in a male from Lakewood, N.J. (July 13, 1902; genitalia on slide 573-Obr.; in AMNH) they are very dark, as in no other of the examined specimens. A rare variety is represented by one male, improperly labelled ("Insectary, June 1908," Kearfott Collection; genitalia on slide 574-Obr.; AMNH). It has the head, thorax, costa of forewings and their cilia orange yellow, but most of the forewings is smoky gray, as in the form *cinderella*.

***Acleris minuta* (Robinson) form *cinderella* Riley**

- Tortrix cinderella* Riley, 1872, in Board Agr., 4th Ann. Rept. Noxious, beneficial and other insects . . . of Missouri, p. 46, fig. 22; 1881, U.S. Ent. Comm. Bull. 6, p. 82.
- Teras cinderella*.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 9.—Grote, 1882, New check list of North American moths, p. 57, no. 21.
- Teras minuta* (in part).—Fernald, 1884, Canadian Ent., vol. 16, p. 64.
- Alceris* [sic] *minuta cinderella*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 475, no. 5319a, 1902.
- Peronea minuta* (in part).—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 61; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 62.
- Peronea minuta* form (var., fall generation) *cinderella*.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7419.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 63, p. 482, 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 314; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 59, no. 7502.

Most of the specimens examined by the present author have the forewings 5–7 mm. in length. Only in one male, improperly labelled ("Exp. 328, 13 Oct. 1908," Kearfott Collection; genitalia on slide 575-Obr.; AMNH), the length of the forewing is 9 mm.

***Acleris gloverana* (Walsingham), new combination**

PLATE 9 (FIG. 31)

- Lophoderus gloveranus* Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 14, pl. 63, fig. 7.
- Lophoderus gloverana* (in part).—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 16.—Grote, 1882, New check list of North American moths, p. 58, no. 63.
- Eulia gloverana* (in part).—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 485, no. 5425, 1902.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 40; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 39.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 177, no. 7393.
- Argyrotaenia gloverana*.—McDunnough, 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7448.—Freeman, 1944, Sci. Agr., vol. 25, p. 92; 1958, Canadian Ent., vol. 90, suppl. 7, p. 52.

The type specimen of *Lophoderus gloveranus* is a male in the collection of the British Museum (Natural History), which the present

author had opportunity to study during his visit to London in 1958. Its genitalia, preprepared and for many years kept dry in a vial, are now on a slide. Unfortunately it was impossible to bring them to a position suitable for a complete examination. It is nevertheless seen from the slide (and the photograph) that they belong to a species of the genus *Acleris* which is related to *A. busckana* (McDunnough). The well-developed cristae of the tegumen and the shape of the valvae are especially characteristic of this little-known species.

TYPE.—Holotype, male (genitalia on slide 5353), Sheep Rock, Siskiyou County, Calif., Sept. 3, 1871 (Walsingham); in BM.

REMARKS.—Walsingham (1879) described *gloverana* as a member of the genus "*Lophoderus*" Stephens. Fernald (1903) placed it in the genus *Eulia* Hübner which is an older synonym of *Lophoderus*. Probably he confused specimens of some other species with *gloverana*, inasmuch as besides California, the type locality of *gloverana*, he mentioned also the State of New York. Forbes (1924) applied the name *gloverana* for a species of the section *Argyrotaenia* Stephens of the genus "*Eulia*," recorded in Massachusetts and New York. The record in the Pacific States Forbes in all probability added on the basis of Walsingham's original data for *gloverana*. The characters of the species called by Forbes "*Eulia* (*Argyrotaenia*) *gloverana*" correspond rather to the species known recently as *Argyrotaenia repertana* Freeman. In his review of the North American *Argyrotaenia* species, Freeman (1944) mentioned *gloverana* as a species unknown to him. In his recent paper, Freeman (1958) suggested that *gloverana* might perhaps be a form of *Acleris variana* (Fernald). None of the above authors had seen the type specimen of *gloverana*, and they based their suggestions about this species exclusively upon the original description and figure of it published by Walsingham.

Acleris maccana (Treitschke)

?*Pyralis repandana* Fabricius, 1798, Supplementum entomologiae systematicae, p. 478.

Peronea marmorana ?Curtis, 1829, British entomology, expl. pl. 16, p. 6.—Westwood and Humphreys, 1845, British moths and their transformations, vol. 2, p. 159, pl. 94, fig. 9.

Teras maccana Treitschke, 1835, Schmetterlinge von Europa, vol. 10, pt. 3, p. 133.—Guenée, 1845, Ann. Soc. Ent. France, ser. 2, vol. 3, p. 143; [1846], Europaeorum Microlepidopterorum index methodicus, p. 9, 1845.—Herrieh-Schäffer, 1847, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, Tortricides, pl. 3, figs. 14-15; 1851, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, p. 149.—Lederer, 1859, Wiener Ent. Monatschr., vol. 3, p. 152.—Wocke, 1861, in Staudinger and Wocke, Catalog der Lepidopteren Europas, p. 94, no. 555; 1871, in Staudinger and Wocke, Catalog der Lepidopteren des europaischen Faunengebiets, p. 233, no. 654.—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum

- pt. 27, p. 208.—Heinemann, 1863, Schmetterlinge Deutschlands und der Schweiz, Abth. 2, vol. 1, pt. 1, p. 16.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 7.—Grote, 1882, New check list of North American moths, p. 57, no. 13.
- Teras abietana* (in part).—Fischer von Röslerstamm, 1837, Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde, p. 69, pl. 34, figs. a-c.
- Teras torquana* Zetterstedt, 1840, Insecta Lapponica, p. 989.
- Glyphiptera maccana*.—Duponchel, 1845, Catalogue méthodique des lépidoptères d'Europe, p. 293.
- Peronea (Lopas) maccana*.—Stephens, 1852, List of the specimens of British animals in the British Museum, pt. 10, p. 16.
- Peronea maccana*.—Westwood, 1854, in Wood, Index entomologicus, ed. 2, p. 266, pl. 57, fig. 1768.—Stainton, 1859, Manual of British butterflies and moths, vol. 2, p. 253.—Wilkinson, 1859, British tortrices, p. 171.—Barrett, 1905, Lepidoptera of the British Islands, vol. 10, p. 226, pl. 453, fig. 2.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 64; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 63; 1927, Revised handbook of British Lepidoptera, p. 525.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7432.—Sheldon, 1919, The Ent., vol. 52, pp. 252-255 and 271-274; 1930, The Ent., vol. 30, p. 222.—Pierce and Metcalfe, 1922, Genitalia of the group Tortricidae, p. 21, pl. 8 (female genitalia); 1935, Genitalia of the tineid families, p. 114, pl. 67.—?Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 486, 1923.—Filipjev, [1931], Ann. Mus. Zool. Acad. Sci. URSS., vol. 31, p. 302, 1930.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 292, 325 (fig. 2), 329 (fig. 2); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7473; 1940, Canadian Ent., vol. 72, p. 59.—Lhomme, 1939, Catalogue des lépidoptères de France et de Belgique, vol. 2, p. 295.—Benander, 1950, Svensk Insektfauna, pt. 10, p. 13, fig. 3b.
- Teras effractana* (in part).—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 27, p. 206.
- ?*Tortrix repandana*.—Werneburg, 1864, Beiträge zur Schmetterlingskunde, vol. 1, pp. 467 and 561.
- Teras fishiana* Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 66.
- Teras fishian* [sic].—Grote, 1882, New check list of North American moths, p. 57, no. 26.
- Acalla maccana*.—Meyrick, 1895, Handbook of British Lepidoptera, p. 523.—Rebel, 1901, in Staudinger and Rebel, Catalog der Lepidopteren des palaearctischen Faunengebietes, vol. 2, p. 81, no. 1149.—Kennel, 1908, Die palaearktischen Tortriciden, p. 74, pl. 4, fig. 17.—Benander, 1929, Ent. Tidskr., vol. 50, p. 136, figs. 9j-k; 1934, Ent. Tidskr. vol. 55, p. 123, pl. 1, fig. 3; 1940, Opuscula Ent. (Lund), vol. 5, p. 56.
- Alceris* [sic] *maccana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 474, no. 5311, 1902.
- Alceris* [sic] *fishiana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 475, no. 5321, 1902.
- Peronea fishiana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 66; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7437.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 483, 1923.—McDunnough, 1940, Canadian Ent., vol. 72, p. 59.

Acalla macana [sic].—Petersen, 1924, Lepidopteren-Fauna von Estland, p. 335.
Acleris maccana.—Obraztsov, 1955, Tijdschr. Ent., vol. 98, p. 193, fig. 357; 1956, Tijdschr. Ent. vol. 99, p. 149.

In his revision of the Canadian *Acleris* (= *Peronea*) species, McDunnough (1934) treated *fishiana* as a synonym of *maccana*, believing that "there are a few very slight, minor differences between the genitalia of European and North American specimens, but scarcely sufficient to warrant the retention of the name *fishiana* Fern. even in a varietal sense." In a more recent paper, McDunnough (1940) changed his opinion, and applied the name *fishiana* in a specific sense. For support of his new point of view, he compared the genitalia of North American specimens of *fishiana* with those of the European *maccana*, and found some differences, especially in the structure of the female genitalia. The most important difference consists of the length of the antrum which in *fishiana* extends over the cephalic margin of the sterigma, being in *maccana* shorter and not reaching this margin. Then, the caudal portion of the ductus bursae is in *fishiana* somewhat expanded, "being largely membranous with only indications of irregular chitinization," and not reaching the cephalic margin of the sterigma. A further difference, found by McDunnough, is the somewhat longer lateral lobes of the sterigma, which are in *fishiana* less outwardly oblique and have a small terminal spine. In the male genitalia, he noted that in *maccana* "the apical section of the tegumen shows a much narrower and shallower median excavation and the lateral flaps are less evident," and "the apical recurvation of the claspers is not so strong, resulting in a broader and shallower excavation of the ventral margin than is the case in *fishiana*." McDunnough emphasized that besides *fishiana* he also had from Canada three female specimens of the true *maccana* which agreed with the European specimens of this species. McDunnough was thus inclined to believe that both *fishiana* and *maccana* are represented in the Canadian fauna.

Because of the variation of the genitalia in the European specimens of *maccana* which show the same extremes as the characters described by McDunnough as typical of *fishiana*, the present author cannot subscribe to the opinion that *fishiana* and *maccana* are separate species. Owing to the transitional shape of the genitalia in certain specimens of *maccana*, it is impossible to recognize the above characters as constant for *fishiana*, the more so because even in the North American specimens this transition has been reported by the present author. A complete coincidence in the variation of the external characters of European and North American specimens confirms their conspecificity. The form *fishiana* corresponds to the nominate form of *maccana*, and falls as its synonym. Besides this form, two

more have been recorded for the Nearctic fauna, and they are inseparable from those known in Europe.

TYPES.—The type of *maccana* is not yet selected; it should originate from the "Böhmisch-Sächsische Grenze" (Bohemia and Saxony frontier), and is probably in the Budapest Museum. Type of *torquana*, male, "Dalecarl. Boh." ("Lappon.-Scania meridionalis"), in the Entomological Museum of the University of Lund, Sweden (cf. Benander, 1940, cited above). Lectotype of *fishiana* (selected by the present author), male, Orono, Maine, Sept. 17, 1879, USNM.

SPECIMENS EXAMINED.—One female (genitalia on slide, prepared by A. Busck, Feb. 22, 1924), Kaslo, British Columbia (H. G. Dyar), USNM; one female (genitalia on slide 414-Obr.), Winnipeg, Manitoba (A. W. Hanham), AMNH; two males and one female (genitalia on slides, prepared by A. Busck, June 28, 1920, and Jan. 8 and 18, 1924), Ottawa, Ontario, Sept. 5, 11, and 12, 1905 (C. H. Young), USNM.

Acleris maccana (Treitschke) form *suffusana* Sheldon

?*Peronea tristana*.—Westwood and Humphreys (not Hübner), 1845, British moths and their transformations, vol. 2, p. 159, pl. 94, fig. 13.

Acalla maccana (in part).—Kennel, 1907, in Spuler, Schmetterlinge Europas, vol. 2, p. 241, pl. 82, fig. 6; 1908, Die palaearktischen Tortriciden, p. 74, pl. 4, figs. 16 and 18.

Peronea maccana form *suffusana* Sheldon, 1930, The Ent., vol. 63, p. 223.

Acleris maccana aberration *suffusana*.—Obratsov, 1956, Tijdschr. Ent., vol. 99, p. 149.

TYPE.—According to Sheldon (1930), the type of this form is figured by Kennel (1908, pl. 4, fig. 16); the original locality and the present location of the figured specimen are unknown.

SPECIMEN EXAMINED.—One male, Montreal, Quebec, Sept. 24, 1898 (Dietz), AMNH.

Acleris maccana (Treitschke) form *leporinana* Zetterstedt

Teras abietana (in part).—Fischer von Röslerstamm, 1837, Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde, p. 69, pl. 34, fig. g.

Tortrix leporinana Zetterstedt, 1840, Insecta Lapponica, p. 980.

Teras maccana (in part).—Herrich-Schäffer, 1847, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, Tortricides, pl. 3, fig. 16; 1851, Systematische Bearbeitung der Schmetterlinge von Europa, vol. 4, p. 149.

Teras lipsiana (in part).—Walker, 1863, List of the specimens of lepidopterous insects in the British Museum, pt. 27, p. 210.—Wocke, 1871, in Staudinger and Wocke, Catalog der Lepidopteren des europaischen Faunengebiets, p. 234, no. 667.

Acalla maccana (in part).—Kennel, 1908, Die palaearktischen Tortriciden, p. 75, pl. 4, figs. 19–21.—Benander, 1940, Opuscula Ent., Lund, vol. 5, p. 53.

Peronea maccana form *canescana* Sheldon, 1930, The Ent., vol. 63, p. 223.

Peronea maccana.—Benander, 1950, Svensk Insektfauna, pt. 10, pl. 1, fig. 5.

Acleris maccana aberration *canescana*.—Obratsov, 1956, Tijdschr. Ent., vol. 99, p. 149.

Acleris maccana aberration *leporinana*.—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 149.

TYPES.—Type of *leporinana* is a specimen from "Abyn." ("Laponia meridionalis"), in the Entomological Museum of the University of Lund, Sweden (cf. Benander, 1940, cited above). According to Sheldon (1930), the type of *canescana* is the specimen figured by Herrich-Schäffer (1847, pl. 3, fig. 16); the original locality and the present location of this specimen are unknown.

SPECIMEN EXAMINED.—One male, Winchendon, Mass., Oct. 20, 1902, AMNH.

Acleris nigrolinea (Robinson)

FIGURE 7, *a*; PLATES 5 (FIGS. 13-16), 11 (FIGS. 36-39)

Teras nigrolinea Robinson, 1869, Trans. Amer. Ent. Soc., vol. 2, p. 281, pl. 7, fig. 67.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 6 (in part).—Grote, 1882, New check list of North American moths, p. 57, no. 7 (in part).—Klots, 1942, Bull. Amer. Mus. Nat. Hist., vol. 79, p. 414.

Alceris [sic] *nigrolinea*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 473, no. 5305 (in part), 1902.

Peronea nigrolinea.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 66; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 64 (in part).—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7435.—Forbes, [1924], Cornell Univ. Agr. Exp. Stat. Mem. 68, p. 484 (in part), 1923.—McDunnough, 1934, Canadian Journ. Res., vol. 11, p. 294; pp. 325 (fig. 3), 329 (fig. 5); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7475.

The present information on this species is rather scanty. The original locality of the type specimen should be Grimsby, Ontario, although the lectotype of *nigrolinea*, selected by McDunnough (1934),

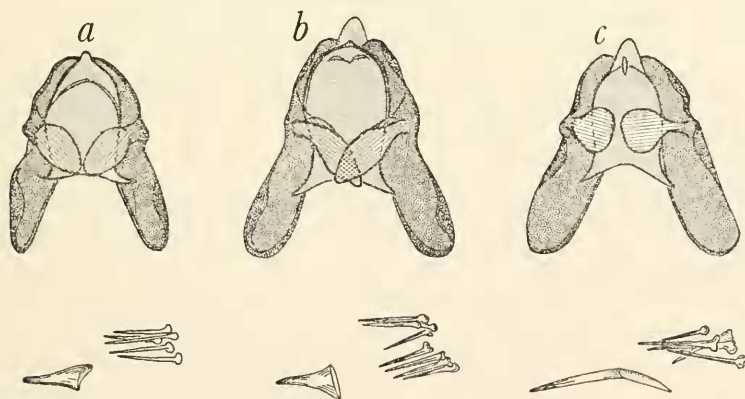


FIGURE 7.—Top portion of the male genitalia, above, and cornuti, below, of three *Acleris* species: *a*, *A. nigrolinea* (Robinson); *b*, *A. disputabilis*, new species; *c*, *A. maxima* (Barnes and Busck).

has no label with the data as to its origin. All specimens examined for the present paper were collected in Manitoba and Quebec, and there are some reasons to suppose that the range of *nigrolinea* is limited to the northeastern part of the Nearctic region. Earlier authors confused *senescens* Zeller and *nigrolinea*, which they treated as synonymous. Even Busck (1931) figured the female genitalia of *senescens* as those of *nigrolinea*. McDunnough (1934) first elucidated this problem, and described and figured correctly the genitalia of both sexes of these two species. On only one point the present author cannot agree with McDunnough, namely, in his treatment of *ferruginiguttana* Fernald as a variation of *nigrolinea*. This problem is discussed in detail in the section of the present paper dealing with the new species *disputabilis*.

TYPES.—Lectotype (selected by McDunnough, 1934), male (genitalia on slide 547—Obr.), no data (Grote and Robinson Collection); lectoparatype, no data (the same collection); both in AMNH.

OTHER SPECIMENS EXAMINED.—One male (without abdomen), Canada (erroneously labeled as "type"), in the Academy of Natural Sciences of Philadelphia. One female, Cartwright, Manitoba (E. F. Heath), USNM. One female (genitalia on slide 402—Obr.), Red Rock Lake, Whiteshell Forest Reserve, Manitoba, May 21, 1954 (C. D. Bird); nine males and five females (genitalia on slides 557—Obr., 559—Obr., 560—Obr., 564—Obr., and 565—Obr.), Aweme, Manitoba, Apr. 4, May 1, 1904; Oct. 19, 20, and 29, 1904; Mar. 24 and 25, Apr. 6, 7, 19, 21, and 26, 1905; Apr. 14–16, 1906 (N. Criddle); one female, Winnipeg, Manitoba (A. W. Hanham); one male (genitalia on slide 551—Obr.), St. Hilaire, Quebec, May 24; AMNH.

Acleris disputabilis, new species

FIGURE 7, *b*; PLATES 6–7 (FIGS. 17–24), 12–14 (FIGS. 40–47)

Peronea nigrolinea var. *ferruginiguttana*.—McDunnough (not Fernald), 1934 Canadian Journ. Res., vol. 11, p. 294; 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7475a

Antennae more or less dark gray-brown, usually with white and black annulation basad. Head whitish gray to ochreous gray; as a rule, scales black checked at tips and (or) middle. Labial palpi externally concolorous with head, more or less black checked; internally whitish to pale ochreous. Thorax as head or darker, sometimes dark brown. Forewings whitish gray to ash gray or brownish, finely powdered with dark gray to blackish brown, and with many similarly colored tufts of raised scales. Some of these tufts arranged in numerous fine oblique transverse lines directed from costa externad. Or, forewings with a rather broad transverse fascia slightly behind middle, consisting of two or three dark gray spots confluent or sep-

arated, one of them at end of discal cell; often, a similarly colored tuft of raised scales basad and dorsad from this fascia, and another one between it and termen. Sometimes an ochreous ray along discal cell, interrupted at middle fascia and almost reaching termen. Sometimes some of veins darker than ground of forewings. Costa with dark gray spots; terminal line black, undulate. Above markings not present in each specimen, and varying in their development and combination. Cilia concolorous with ground of forewings, or somewhat paler. Under side of forewings more or less dark brownish gray, sometimes with whitish and blackish costal spots. Length of forewing, 11–14 mm. Hind wings pale fumose with grayish brown reticulation; cilia concolorous with ground or slightly paler with dark-gray basal line, sometimes with a dividing line.

MALE GENITALIA.—Tegumen slightly excavated at tip, without cristae; gnathos broad without any spiculation; socii decumbent, elongate, broadly lanceolate. Valvae narrowed apicad; brachiola rather large; sacculus drawn out into a more or less long acute or blunt point before half, sometimes with small additional thornlike projections before this point, then curving costad sharply and strongly, forming a large rotundate ventral excavation, and descending to a more or less sharply pointed tip directed downward; apical tuft moderate. Aedeagus strongly curved, stout at base, then tapering; vesica with a cluster of four to eight cornuti capitate at base, and a stout robust thornlike apical cornutus dilated basad.

FEMALE GENITALIA.—Sterigma with strongly dilated, then tapering lateral lobes with tipes more or less acute and usually curved. Antrum wide and long, bifurcate cephalad, sclerotized especially caudad. Ductus bursae slightly longer than cervix bursae, almost as broad as antrum, somewhat narrowed cephalad. Cervix bursae moderate, broader than adjacent part of ductus; corpus bursae rotundate or slightly ovate; signum stellate, scobinate.

TYPES.—Holotype, male (genitalia on slide, prepared by A. Busck, Sept. 6, 1923), Goldstream, British Columbia, Oct. 16, 1902; allotype, female (genitalia on slide, prepared by A. Busck, Aug. 20, 1923), Wellington, British Columbia, Mar. 29, 1903; one male paratype (genitalia on slide, prepared by A. Busck, Jan. 21, 1924), Duncans, Vancouver Island, British Columbia, Sept. 17, 1913 (A. W. Hanham); all three specimens in USNM. Paratypes: one male (genitalia on slide 566-Obr.), Victoria, British Columbia, April 15, 1910 (A. J. Croker); one female (genitalia on slide 563-Obr.), the same locality, Nov. 22 (A. W. Hanham); AMNH.

Other specimens examined: One female (genitalia on slide, prepared by A. Busck, Oct. 16, 1924), Hymers, Ontario, April, USNM. One male (genitalia on slide 540-Obr.), Satus Creek, 10 miles from

Toppenish, Wash., Apr. 14, 1956 (A. I. Good); one male (genitalia on slide 391-Orb.), Spring Creek, 4000 ft., near Baker, Baker County, Ore., May 7, 1953 (J. H. Baker); one female (genitalia on slide 561-Obr.), San Mateo, Calif., Mar. 6, 1942 (G. E. Pollard); one female (genitalia on slide 562-Obr.), Sierra Nevada, Calif.; one female (genitalia on slide 558-Obr.), Fort Collins, Colo., Aug. 12, 1898 (Kearfott Collection); one female (genitalia on slide 553-Obr.), Salida, Colo., Apr. 7, 1888 (Hulst Collection); all in AMNH. Three females (genitalia of two of them on slides: one prepared by A. Busek, Nov. 14, 1924; the other, no. 1-Obr., Nov. 2, 1959), Salida, Colo., Apr. 7, 1888, and Apr. 4 and 6, 1889 (W. S. Foster; Fernald Collection); one male (genitalia on slide, prepared by A. Busek, Nov. 13, 1924), no data (Fernald Collection); one female (genitalia on slide 2-Obr., Nov. 2, 1959), Jemez Springs, N. Mex., Apr. 8, 1915; the five specimens in USNM.

REMARKS.—This is the species which the late A. Busek was inclined to identify with *Teras ferruginiguttana* Fernald (cf. McDunnough, 1934, p. 294). At the time when Busek wrote McDunnough about his conception of *ferruginiguttana*, the unique female type of this species was already nonexistent and was represented only by some few fragments useless for any diagnostic purpose. In this poor condition this type is now deposited at the United States National Museum, and the present author can describe it as a small portion of thorax with one of the hind legs and basal part of a hind wing. The only information upon the type of *ferruginiguttana* is in the original description of this species (Fernald, 1882, p. 65). This description gives some reasons to suppose in *ferruginiguttana* a species related to *maximana* and *nigrolinea*, but it is also quite possible that *ferruginiguttana* might belong to some other group. None of the specimens, identified by Busek as *ferruginiguttana* and deposited at the U.S. National Museum, correspond completely to the original description of this species which should have in the forewings "a tuft on the fold near the base of the wing, an elongated streak through the oblique stripe on the cell, and a spot between this and the outer border, bright rust-red." Busek himself was probably not quite convinced of his conception of *ferruginiguttana*, and there is in the above collection only one female specimen from Colorado with Busek's authentic label on the pin, reading "*P. ferruginiguttana* Fern." Some other specimens have this name on the genitalia slides only, and it is always written by Busek in pencil and usually accompanied by a question mark. Moreover, *ferruginiguttana* appears on these slides as a second name, the first one, written in India ink, being "*Peronea maximana*." In his unpublished manuscript notes of October 1919, Busek wrote: "7438. *P. ferruginiguttana* Fernald. Colorad[o]. 28 mm. Our largest described species.

Unfi[?ttingly] desc[ribed] from a *unique female!* Gray with rust-red streak on cell a[n]d tuft on fold. Not represented in B.[arnes] coll[ection] an[d] I cannot id[e]nt[i]fy it as any of the large Northwest specim[ens] [from] B.[ritish] C.[olumbia] which I shall descr[i]be as [a] *n.[ew] sp.[ecies].*”

Thus, there is no other choice but to treat *ferruginiguttana* as a “species dubia” without any definitive diagnosis. Any attempt to apply this name to some *Acleris* specimens would merely be based on a simple speculation which might be rejected by later authors. Since the type specimen of *ferruginiguttana* is destroyed, and therefore its genitalia cannot be studied, it seems safer to recognize this name as unavailable for systematic use. For this reason, the present author has decided to propose for the species treated, without proof, by Busck and McDunnough as Fernald’s *ferruginiguttana*, the name *disputabilis*, new species.

McDunnough (1934) regarded the specimens of this species, occurring in the western Canadian provinces, as agreeing in genitalia with those from Colorado, identified by Busck with *ferruginiguttana*, and used this latter name in a varietal sense, for a form of *nigrolinea*. The specimens from Manitoba, Alberta, and British Columbia McDunnough believed to belong to this variety, whereas the specimens from Ontario he referred to the nominate form of *nigrolinea*. On the basis of an essential material, the present author has established genitalic differences between the specimens from British Columbia and Manitoba, and he can only identify those from British Columbia with his new species *disputabilis* (*ferruginiguttana* Busck and McDunnough, not Fernald). He has found the specimens from Manitoba inseparable from *nigrolinea*.

It is quite difficult, if not impossible, to recognize *disputabilis* on the basis of its external characters. The color of forewings and their markings vary so much in this new species that some specimens can easily be confused with *nigrolinea* or *maximana*. Only the genitalia give a basis for separation. In their general shape the male genitalia of *disputabilis* resemble those of *nigrolinea*, but differ from them in some details. The socii of *disputabilis* are somewhat longer than in *nigrolinea*, and are distinctly tapering apicad. The angle of sacculus before its half is prolonged in a stouter thornlike projection than in *nigrolinea*, in which this projection is slightly bent upward. The excavation of sacculus externad from this projection is in *disputabilis* somewhat deeper, and the tip of sacculus is longer than in *nigrolinea* and ends more acutely. In general, the valva of *disputabilis* is more downcurved than in *nigrolinea*. In the female genitalia, *disputabilis* differs from *nigrolinea* in having the lateral lobes of sterigma much

broader and less tapering, and the antrum somewhat broader and longer. The difference between *disputabilis* and *maximana* is more remarkable: The gnathos of the new species has no spiculation, the socii are longer and of a distinctly other shape, the valva is more downcurved, the external excavation of sacculus is narrower, and the apical cornutus of the vesica has a flat base. The lateral lobes of sterigma of *disputabilis* are more rotundate apicad, and they usually are more bent than in *maximana*.

The variation of external characters of *disputabilis* is very large, but the present knowledge of it is inadequate for separation of geographic forms. The range of this western Nearctic species is probably limited by the Rocky Mountains, although in Canada *disputabilis* is known from one female specimen from east of this line, in Ontario.

Acleris maximana (Barnes and Busck), new combination

FIGURE 7,c; PLATES 8 (FIGS. 25-28), 15-18 (FIGS. 48-60)

Peronea maximana Barnes and Busck, 1920, Contr. Nat. Hist. Lep. North America, vol. 4, p. 216, pl. 32, fig. 1.—Blackmore, 1921, British Columbia Prov. Mus. Rept. for 1920, pp. 24 and 28, pl. 2.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 295, 325 (fig. 4), 329 (fig. 6); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7476.

Peronea maxima [sic].—Heriot, 1935, Proc. Ent. Soc. British Columbia, vol. 31 (for 1934), p. 32.

McDunnough (1934) gave a quite accurate redescription of average specimens of *maximana*, but it does not completely cover the variation of this species. The ground color of the forewings varies from whitish gray and bluish gray to smoky gray or brownish gray. Some specimens have the forewings with markings rather complete, but in others these markings are obliterate or lacking; in some, dark gray spots are present. The spots, situated before the last third of the forewing, sometimes form a kind of interrupted transverse fascia. A dark spot on discocellulars is often developed. In some specimens the forewings are dark sprinkled or reticulated, in others they are strigate because of dark lines on veins. Along the discal cell of the forewings a yellowish ray is sometimes present which reaches almost to the termen below apex. Hind wings are whitish, more or less smoky, often with fine dark reticulation. The above variation obscures any constant characters distinguishing *maximana* from *nigrolinea* Robinson and *disputabilis*, new species. As discussed above under *disputabilis*, the genitalia give, in spite of their variation, a basis for separating these three species. In the male genitalia, this variation is seen in the shape of the valvae. The angle of the sacculus before half is either produced into a rather acute or blunt point, or it is simply rounded. The number of cornuti in the group varies from five to eight.

TYPE.—Holotype, male (genitalia on slide, prepared by A. Busck, Oct. 4, 1919), Victoria, British Columbia, Sept. 16, 1909 (A. J. Croker), USNM.

OTHER SPECIMENS EXAMINED.—Five males (genitalia of three on slides, prepared by A. Busck, Sept. 27, 1923, and Jan. 7 and 8, 1924), Rampart, Alaska; one female (genitalia on slide, prepared by A. Busck, Jan. 11, 1924), Duncans, Vancouver Island, Apr. 18, 1908 (A. W. Hanham); one female (genitalia on slide, prepared by A. Busck, Sept. 14, 1923), Quamichan Lake, Vancouver Island, Apr. 4, 1916; one male (genitalia on slide, prepared by A. Busck, Oct. 10, 1923), Fraser Mills, British Columbia, Sept. 11, 1921 (L. E. Marment); two females (genitalia on slides, prepared by A. Busck, Sept. 5, and Nov. 8, 1923), Wellington, British Columbia, no date (R. V. Harvey) and Mar. 24, 1903; all in USNM. Three males and three females (genitalia of all males and one female on slides 539-Obr., 548-Obr., 544-Obr., and 568-Obr.), Wellington, British Columbia, Mar. 28, 1903, and April (G. W. Taylor); one male (genitalia on slide 554-Obr.), Robson, British Columbia, May 2, 1938; specimens in AMNH. One male (genitalia on slide, prepared by A. Busck, Oct. 16, 1924), Hymers, Ontario, USNM. One female (genitalia on slide 424-Obr.), Spring Creek, 4000 ft., near Baker, Baker County, Oreg., June 10, 1953 (J. H. Baker); one male (genitalia on slide 552-Obr.), Wagon Camp, Mount Shasta, Calif., June 12, 1939 (collection of G. H. and J. L. Sperry); one male and one female (genitalia on slides 542-Obr. and 567-Obr.), Sierra Nevada, Calif.; specimens in AMNH. One female (genitalia on slide, prepared by A. Busck, Oct. 4, 1924), Plumas County, Calif., Apr. 16–23; one female, Fallen Leaf Lake, Calif., Sept. 27, 1932 (H. H. Keifer); one male (genitalia on slide, prepared by J. K., Oct. 1, 1924), Glenwood Springs, Colo., Apr. 20, 1895 (W. Barnes); specimens in USNM. One male (genitalia on slide 556-Obr.), Glenwood Springs, Colo., one male (genitalia on slide 185-Obr.), near Alpine Ranger Station, 9500–13000 ft., Gunnison County, Colo., July 5, 1957 (F. and P. Rindge); specimens in AMNH. One male (genitalia on slide, prepared by A. Busck, Aug. 22, 1938), campus, Utah State Agricultural College, Logan, Utah, at light, Apr. 13, 1935 (G. F. Knowlton), USNM. One male (genitalia on slide 569-Obr.), New York (G. D. Hulst Collection); one male (genitalia on slide 534-Obr.), Pennsylvania (G. D. Hulst Collection); specimens in AMNH.

FOOD PLANTS.—*Populus balsamifera* and apple (McDunnough, 1934); *Prunus emarginata*, according to data on specimen from Fallen Leaf Lake, Calif.

Acleris emargana blackmorei, new subspecies

- Rhacodia effractana*.—Walsingham, 1879, Illustrations of typical specimens of Lepidoptera Heterocera, pt. 4, p. 76.
- Teras effractana*.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 5.—Grote, 1882, New check list of North American moths, p. 57, no. 1.—Moffat, 1891, Canadian Ent., vol. 23, p. 168.
- Acleris* [sic] *effractana*.—Fernald, [1903], U.S. Nat. Mus. Bull. 52, p. 472, no. 5299, 1902.
- Peronea caudana*.—Meyrick, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 59; 1913, in Wytsman, Genera insectorum, fasc. 149, p. 61.—Barnes and McDunnough, 1917, Check list of the Lepidoptera of Boreal America, p. 178, no. 7412.
- Peronea emargana*.—McDunnough, 1934, Canadian Journ. Res., vol. 11, pp. 291, 325 (fig. 1), 329 (fig. 1); 1939, Mem. Southern California Acad. Sci., vol. 2, p. 58, no. 7472.
- Acleris emargana* (in part).—Obraztsov, 1956, Tijdschr. Ent., vol. 99, p. 151.

MALE.—Forewings dark gray brown to ruddy brown, usually with a more or less wide, reddish area near tornus; costa with a very flat excavation. Length of forewing, 8–11 mm.

FEMALE.—Similar to male, but excavation of costa of forewings deeper.

TYPES.—Holotype, male (genitalia on slide, prepared by A. Busck, Mar. 3, 1924), Goldstream, British Columbia, Aug. 7, 1923 (E. H. Blackmore); allotype, female, the same data, Aug. 6, 1923. In USNM (no. 65591).

PARATYPES.—British Columbia: four males and four females (genitalia of one male on slide, prepared by A. Busck, Mar. 4, 1924), Goldstream, Sept. 5, 1920, and Aug. 6–7, 1923 (E. H. Blackmore); one male and four females (genitalia of three females on slides, prepared by A. Busck, Mar. 1 and 2, 1924, and Nov. 9, 1923), Victoria, Sept. 9, 1920, Sept. 2, 1921, and Aug. 24, and Sept. 8, 1922 (E. H. Blackmore); one male, the same locality, July 26, 1922 (W. R. Carter); two males (genitalia of one on slide 557, prepared by C. Heinrich), Kaslo, July 25, 1894, and May 20, 1899 (H. G. Dyar); all the above paratype specimens in USNM; one male, Vancouver Island, AMNH. Ontario: one male, Ottawa, Aug. 5, 1905 (C. H. Young), AMNH. Washington: two males (genitalia of one on slide 735, prepared by J. F. Gates Clarke, Nov. 7, 1934), Toad Lake, Whatcom County, Sept. 3, 1929 (J. F. Gates Clarke); one male, Bellingham, Whatcom County, July 25, 1923 (J. F. Gates Clarke); one male and one female, Lake Ballinger, Snohomish County, Aug. 19, 1930 (T. C. and J. F. Gates Clarke); all the above specimens from the State of Washington; in USNM.

REMARKS.—This subspecies is named for E. H. Blackmore. The name has been adapted from labels on genitalia slides prepared by A. Busck who considered *blackmorei* to be a separate species. There

is no reason to follow this point of view, because the genitalia of North American specimens do not differ from those of the European moths. Inasmuch as the North American specimens of *emargana* have a flatter excavation of the costa of the forewings in males than the European aberration *caudana* Fabricius of this species, the present author believes that it is reasonable to distinguish them as a separate subspecies. The general appearance of *blackmorci* is very similar to that of the European *caudana*.

In the U.S. National Museum there is a single female from Brackenridge, Colo., taken in June by Oslar (genitalia on slide 1-Obr., Jan. 9, 1959). It differs in the color of forewings from the remaining specimens known from North America, and reminds one rather of the European aberration *scabrana* Fabricius of *emargana*. Until further specimens of this color form are known in this country, its systematic position cannot be ascertained.

References

BUSCK, A.

1931. On the female genitalia of the Microlepidoptera and their importance in the classification and determination of these moths. Bull. Brooklyn Ent. Soc., vol. 26, pp. 199-216 (incl. pls. 9-13).

DARLINGTON, E. P.

1947. Notes on certain types of Lepidoptera described by Brackenridge Clemens. Trans. Amer. Ent. Soc., vol. 73, pp. 85-104.

ESSIG, E. O.

1941. Itinerary of Lord Walsingham in California and Oregon, 1871-1872. Pan-Pacific Ent., vol. 17, pp. 97-113, 2 text figs., 1 pl.

FERNALD, CHARLES HENRY

1882. Descriptions of new species of Tortricidae. Trans. Amer. Ent. Soc., vol. 10, pp. 65-72.

1903. Family Tortricidae. In Dyar, H. G., A list of North American Lepidoptera and key to the literature of this order of insects. U.S. Nat. Mus. Bull. 52, pp. 448-489. 1902.

FORBES, W. T. M.

1924. The Lepidoptera of New York and neighboring states. Cornell Univ. Agr. Exp. Stat. Mem. 68, 729 pp., 439 text figs. 1923.

FREEMAN, T. N.

1944. A review of the North American species of the genus *Argyrotaenia* Stephens. Sci. Agr., vol. 25, pp. 81-94, 1 pl.

1958. The Archipinae of North America. Canadian Ent., suppl. 7, 89 pp., 258 figs.

HEDDERGOTT, H.

1953. Tortricidae. In Appel, O., and Blunck, H., Handbuch der Pflanzenkrankheiten. Vol. 4, pt. 1, fasc. 2, pp. 106-177, figs. 41-64. Berlin and Hamburg.

HERRICH-SCHÄFFER, GOTTLIEB AUGUST W.

1847. Systematische Bearbeitung der Schmetterlinge von Europa . . . Vol. 4, Tortricides, pl. 3. Regensburg.

DE JOANNIS, J.

1919. Une visite à la collection de microlépidoptères d'Achille Guenée. Ann. Soc. Ent. France, vol. 88, pp. 1-40.

- KAVEN, G.
1934. Krankheiten und Schädlinge an Rhododendron. Kranke Pflanze, vol. 11, pp. 123-126.
- VON KENNEL, JULIUS
1908. Die palaearktischen Tortriciden. Zoologica, vol. 21, fasc. 54, pp. 1-100 (+2+12 pp.), pls. (1)+1-6.
- KLOTS, A. B.
1942. Type material of North American Microlepidoptera other than Aegeriidae in the American Museum of Natural History. Bull. Amer. Mus. Nat. Hist., vol. 79, pp. 391-424.
- MCDUNNOUGH, JAMES H.
1934. The Canadian species of the tortricid genus *Peronca*. Canadian Journ. Res., vol. 11, pp. 290-232, 81 figs.
1940. Notes on the genus *Peronca* with description of a new species. Canadian Ent., vol. 72, pp. 59-61, 1 fig.
- MEYRICK, EDWARD
1895. A handbook of British Lepidoptera. vi + 843 pp. London.
1934. Tortricidae. In Caradja, A., and Meyrick, E., Materialien zu einer Microlepidopteren-Fauna Kwangtungs (Fortsetzung). Iris, vol. 48, pp. 28-43.
- OBRAZTSOV, NICHOLAS S.
1949. Zur Schwankung der Cornuti-Zahl bei *Peronca hastiana* (L.). Mitt. Münchener Ent. Ges., vol. 35-39 (for 1945-1949), pp. 211-213.
1957. Die Gattungen der palaearktischen Tortricidae. I. Allgemeine Aufteilung der Familie und die Unterfamilien Tortricinae und Sparganothinae. 3. Fortsetzung und Schluss. Tijdschr. Ent., vol. 100, pp. 309-347.
- PAPE, H.
1939. Die Praxis der Bekämpfung von Krankheiten und Schädlingen der Zierpflanzen, 3rd ed. viii + 475 pp., 8 pls., 336 text figs. Berlin.
- PIERCE, F. N., and METCALFE, J. W.
1922. The genitalia of the group Tortricidae of Lepidoptera of the British Islands. xvii + 101 pp., 34 pls. Oundle, Northants.
1935. The genitalia of the tineid families of the Lepidoptera of the British Islands. xxii + 116 pp., 68 pls. Oundle, Northants.
- SHELDON, W. G.
1923. *Peronca hastiana* L.: its distribution, habits, life-cycle and variation. The Ent., vol. 56, pp. 75-81, 100-104, 128-131, 149-153, 173-178, 197-202, 221-226, 248-252, 269-271; pl. 2.
1930. Notes on the nomenclature and variation of British species of the *Peronca* group of the Tortricidae. The Ent., vol. 63, pp. 121-124, 148-151, 175-178, 193-198, 222-225, 242-246, 273-277; pl. 4.
- SORHAGEN, LUDWIG
1901. Grabowiana. Ein Nachtrag zu den "Kleinschmetterlingen der Mark Brandenburg" (Fortsetzung). Allgem. Zeitschr. Ent., vol. 6, pp. 311-314.
- SWATSCHEK, B.
1958. Die Larvalsystematik der Wickler. Abhandlungen zur Larvalsystematik der Insekten, no. 3. (6) + 269 pp., 276 text figs. Berlin.
- WALSINGHAM, THOMAS DE GREY, LORD
1879. Illustrations of typical specimens of Lepidoptera Heterocera in the collection of the British Museum, Part 4. North American Tortricidae. xi + 84 pp., pls. 61-77. London.